A Lecture
ON
TUBERCULOSIS AND THE MILK-SUPPLY, WITH SOME GENERAL REMARKS ON THE DANGERS OF BAD MILK.

Delivered at Sudbury Hall at the invitation of Lord Vernon, on Thursday, September 15th,

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GENTLEMEN,—Some months ago Lord Vernon wrote to me with regard to the work which is being done in his Sudbury estate and with special reference to his anxiety to free all the cattle on his farms from tuberculosis. It is well known that a considerable initial expense is attendant on carrying out such a plan. The difficulty is further increased on account of the well-known tendency which practical men generally, and especially farmers, have to look with suspicion upon any new idea which is not in accordance with the practice of their predecessors. History acquaints us with the value of such arguments; if man had not from time to time risen above traditional practices we would have been deprived of the benefits of steam and electricity, or of sanitation, without speaking of greater boons still, such as the freedom of conscience and the impartial administration of justice which we enjoy under the British Constitution.

The difficulty of dealing with tuberculosis is further increased by the general ignorance of the public. The danger which they incur from a contaminated milk-supply is appalling in its magnitude, yet because this danger is of an insidious nature and its effects are often so gradual that it is difficult to trace their onset they prefer to have their quietude not disturbed. They are also afraid that their purses might have to be opened. Rather than face such possibilities they prefer to believe the few experts who still hold views which numerous most searching investigations have proved to be wrong. They still hold that tuberculosis is a disease chiefly due to climatic conditions and to hereditary tendencies. The belief that tuberculosis is transmitted from parent to offspring is one of the traditions most inimical to progress with regard to the prevention of this disease. It gives to the mind a sense either of helplessness or of the necessity of measures, such as segregation, which would be repellent to our affections and which nothing but an immense peril could induce us to contemplate.

Tuberculosis is a disease which is acquired almost invariably after birth owing to the penetration in our organs of a minute parasite. We know now this parasite and most of the ways in which it can gain entrance into our body. This being so we should be able to defend ourselves by avoiding or destroying this enemy. I am convinced that if people could see the tenth part of what we students of disease have a too frequent opportunity of witnessing they would be convinced at once of the necessity of taking proper precautions against the disease. It is this conviction which has led me to accept the invitation which Lord Vernon has done me the honour to send me and to give you a short account of tuberculosis and of the way in which milk may assist its spread. It gives me much pleasure to do what I can to assist Lord Vernon in his good work—work which is undoubtedly of great public importance. Many others might do it better than I can, but I will speak with the conviction which fifteen years of continuous pathological studies have given me. Many here are experts before whom I would hardly think it necessary to repeat what to most of them are truths firmly established; they must, however, excuse me if, keeping in mind the nature of the invitation given me by Lord Vernon, I address myself to those who have directed their activities to other fields than the study of disease. Perhaps had I known that instead of coming here to give some information to Lord Vernon's tenants I should have had to address such a gathering of distinguished experts, with Sir William Broadbent in the chair, I should have accepted his lordship's invitation less readily.

Tuberculosis is produced by the penetration into various parts of our body of a very small vegetable parasite, which was first described by Koch sixteen years ago. This bacillus is quite invisible to us unless we help our powers of vision by means of the microscope. It is so small that particles of dust minute enough to be easily raised by slight currents of air may contain many of them, so that we may breathe air loaded with the parasite without our being conscious of it. In the same way it may be present in milk without our being aware of its presence. It does not multiply readily outside the body of its victims, but it has extraordinary powers of resistance. It is but slightly affected by the greatest extremes of heat or cold of our seasons; it may be kept dry for several months without dying or ceasing to be able to produce disease; it resists immersion in water, putrefaction, burying in the ground for days, weeks, or months; and the only natural agency which seems rapidly fatal to it is sunlight. It is generally admitted that this bacillus does not grow readily outside the body of animals liable to tuberculosis, yet by taking proper precautions it is not very difficult to make it grow on suitable substances, and I satisfied myself several years ago that it is quite possible for the conditions necessary to occur in nature. Up to the present time, however, we have no clear evidence that this multiplication of the bacillus outside living tissues plays an important part in the spread of the disease. I have for the last six years tried to find whether this multiplication outside the body might be of importance under ordinary circumstances but have not succeeded in coming to a definite conclusion. I will therefore assume that for the present we need only discuss the share which tuberculous men or animals have in the spread of the disease.

Let us suppose that a few particles loaded with tubercle bacilli have been carried into the lungs of a person. These bacilli will, by means of the products which they secrete, produce irritation of the part and, if sufficiently numerous or active, they will rapidly cause the deaths of a few cells. Then a fight, first described by Metschnikoff, will follow during which some of the cells composing the tissues of the person attacked will surround the bacilli, take them up into their bodies, and digest them if they can. If the cells are sufficiently active and the bacilli not too virulent the microbes will either be killed or rendered harmless and, fortunately for us, this takes place in a large number of instances. When the fight is short nothing appreciable remains to show what has taken place. If the contest is more equally balanced a number of cells die, undergo caseous degeneration—i.e., a kind of fermentation similar to that which takes place in ripening cheese—and a so-called cheesy nodule or tubercle is produced; this becomes surrounded by scar tissue and may gradually be infiltrated with lime salts. These cheesy or chalky nodules may remain in the tissues till the individual dies from some other cause. When they are found in the organs after death it is generally assumed that they indicate a victorious fight of the tissues against the microbes and for that reason these lesions are described as of "healed tuberculosis of phthisis." In many cases, unfortunately, the fight does not end so favourably. After being checked for a longer or shorter period the bacilli manage to multiply in the midst of the enfeebled or dead tissues. This takes place more specially when these tissues have been weakened by some congenital vice of constitution or by some recent disease or unfavourable condition which has reduced the activity of the cells or killed many of them. As the bacilli multiply they extend beyond the margin of the area which they first invaded. Some are carried away by wandering cells which move in a system of channels and spaces permeating all our tissues and which are known as lymphatic spaces and vessels.

On the course of the larger lymphatic vessels there are organs known as lymphatic glands or ganglia through which the lymph is elaborated and, so to speak, filtered before it can pursue its course along the lymph-vessels. Before this lymph can reach the blood-vessels it has to pass through a number of these glands. Now, the bacilli contained in the wandering cells continue their fight and the diseased cells become arrested in the first lymphatic gland which they reach which is usually very near the point where the bacilli have entered the body. I have assumed that all the bacilli are carried along by cells. This may not be the only way in which they spread along the lymphatics. The fact, however, remains that they rapidly reach the lymphatic ganglia which are connected with the place where the bacilli have penetrated. They have now reached the second line

of defence the fight is there renewed and in some cases the bacilli are checked and though they may produce extensive disease of the gland they are unable to go further. This form of tuberculosis of the lymphatic glands is generally known under the name of scrofula (one of the forms of the old king's evil), on which so much has been written. This form of disease has been lately thoroughly investigated in my laboratory by Dr. F. C. Moore, who has recently embodied the results of his experiments and observations in a most valuable monograph.[1] Out of 26 cases of chronic enlargement of the glands, mostly of the neck, which had to be operated upon for various reasons, not less than 19—i.e., a little over 73 per cent.—were found to be tuberculous.

Lymphatic glands are not the only organs which are liable to this chronic form of tuberculosis—bones and joints, for instance, are often affected in the same way. In a large number of cases, however, the bacilli pass beyond this second line of defence and, after overcoming a number of other glands, they may finally affect most of the lymphatic glands of the body. It is easy for me to demonstrate this process to you by a series of guinea-pigs inoculated with minute doses of tuberculous matter taken either from human or bovine lesions. Tuberculosis has a remarkable tendency to remain confined to the lymphatics and to certain internal organs for a comparatively long period. The spread of the disease along the lymphatics presents a remarkable peculiarity to which I attracted the attention of pathologists some years ago.[2] After following the course of the lymph so closely for a time, that only those glands receiving lymph from the part infected become diseased, other glands not situated on the course of the lymph-stream become invaded as if the tuberculous process extended back against the lymph-current. Thus it is found that after the glands at the root of such organs as the lungs have become tuberculous those organs themselves usually become rapidly diseased. According to our expectations, based on current knowledge of the course followed by the lymph, the viscera should be affected first and the glands receiving the lymph from them should be affected last. I do not wish to trouble you here with a discussion of the nature of this phenomenon but its practical importance in connexion with tuberculosis of the udder is evident. Whenever the glands receiving the lymph from the udder become affected the possibility of the udder being already diseased or about to be diseased should be considered even in those cases in which the udder appears on external examination absolutely normal.

The further stages of the disease are produced in two ways. Either the interference with important organs and the generation of poisonous substances by the bacillus or both combined cause a general state of debility and fever which ends in death or the disease becomes generalised by the bacilli penetrating in comparatively large numbers into the blood-vessels. One of the ways in which this takes place is by ulceration of the walls of some veins passing through or at the side of some tuberculous focus; tuberculous matter loaded with bacilli is thrown through the opening in the walls of the vessel into the blood-stream and is distributed to all the organs of the body. Wherever the bacilli get lodged they give rise to small centres of disease similar to those which I have already described. These lesions have the form of small nodules, grey and transparent at first, becoming afterwards yellow in the centre owing to cheesy degeneration. Owing to their size being usually that of a millet-seed these tubercles are known as miliary tubercles. These tubercles may be found in all parts of the body and of course render all the tissues infectious; hence the danger of eating the uncooked flesh of animals in which tuberculosis has become general. It is for this reason that carcasses of animals affected with general tuberculosis are invariably condemned by sanitary authorities. This form of the disease is rapidly fatal.

I have passed over certain changes taking place in the lesions of localised tuberculosis in order to give you a connected view of the progress of the disease when once it has taken hold of our body or of that of an animal such as the cow, the horse, the pig, &c. There are differences in the various animals, but these need not be discussed here as they are not essential. The destruction of tissues in certain organs of the body is associated with consequences of great practical import, for it is to them that is due the danger of infection of healthy individuals by diseased ones. To make the consequences of ulceration clearer to you I will show you the effects of tuberculosis affecting the skin of the face of some patients suffering from that dreadful disease, tuberculous lupus. You notice first the effects of the reaction of the tissues giving rise to considerable swelling and deformity, then the tissues decay, soften, and crumble away, and prominent parts of the face are removed as if bitten away and may even be replaced by ghastly cavities. What takes place on the face occurs also in the lungs, the kidneys, the bowel, and the mamma when these parts are affected with local tuberculosis. Now, the mass of decayed matter which is set loose by this ulceration contains in some cases large numbers of tubercle bacilli. The ulcers which in the lungs take the form of cavities empty themselves into the air-passages from which their contents escape through the mouth when the patient expectorates or they are swallowed as soon as they reach the back of the mouth and go down the bowels where they may start fresh mischief and render excreta infectious. It is easy to demonstrate the presence of these tubercle bacilli in the expectoration of phthisical patients or animals; they can also be demonstrated in their excreta. These dried discharges scattered by draughts in the air render the houses or places inhabited by phthisical persons or animals dangerous when absolute cleanliness is not observed. This is the chief source of tuberculous disease in man, in cattle, and in some of our pets—such as dogs. Out of 80,943 persons dying from all cases in London during 1897 in no less than 10,984 cases the death was registered as due to tuberculous disease. Out of these 10,984 cases 7864 are put down to phthisis. Though it is not proved that all cases dying from pulmonary phthisis have been infected through the air passages it is reasonable to assume that most of them have.

In the same way as bacilli are liberated from the lungs and scattered outside the body they are by the same process of ulceration set free in the intestine, in the kidney, in the mamma, and in subcutaneous lesions and pass out of the body with excrements, urine, milk, and purulent discharges. Now some of these products after becoming dry may infect fresh victims by contamination of the air just as dry tuberculous sputa have been shown to do. But with milk the case is different. It is through the intestine that tuberculous milk attacks the body. It has been denied that the consumption of tuberculous milk is attended with serious danger. I think, however, that there is a sufficient number of instances in which this danger has been proved by the actual occurrence of tuberculosis in children who have been fed on milk from tuberculous cows. By experiments on young animals such as kittens, rabbits, pigs, and calves, it is quite easy to produce tuberculosis by feeding these animals on tuberculous milk or other tuberculous products. Thirty years ago, that is about three years after Villemin had announced and admirably proved that tuberculosis was an infectious disease communicable from man to animal and from animal to animal (and not essentially a constitutional one as was then believed), Chauveau demonstrated experimentally that tuberculosis could be induced in cattle by feeding them on tuberculous products. Nearly thirty years have been necessary to allow public opinion to come to the conclusion that these men of science were right. In the reports of the last two Royal Commissions on Tuberculosis we find the following statement: "No doubt the largest part of the tuberculosis which man obtains through his food is by means of milk containing tuberculous matter." It is difficult to prove when a child dying from tuberculosis has been infected through milk because before the death occurs or the disease becomes manifest the milk supply may have often been changed and milk diet has often given place to ordinary diet. As I have said there are cases in which no such doubt exists and in which tuberculosis has been traced to the consumption of tuberculous milk. Lord Vernon and Dr. Livesay have informed me that they know of a farm where such a case has occurred. There are, however, very often clear indications in the body of the victim showing the channels through which the bacilli have penetrated. We have seen how the bacilli infect first the lymphatic glands nearest to their point of entrance. The lymph coming from the intestine passes first through the mesenteric glands. The lymph from the lungs passes in the same way through the bronchial glands. It is therefore evident that in the event of the bacilli penetrating through the intestine the mesenteric glands would be chiefly affected and in the case of lung

[1] Vict. M.D. Dissertation, Manchester, 1898.
[2] Brit. Med. Jour., September, 1893, and March, 1894.

infection the bronchial ganglia would be most involved. There are cases in which death occurs before any other glands than those first invaded have had time to become diseased; in such cases the state of the glands will clearly indicate the channel through which the bacilli have entered.

In a series of over 300 experiments I have found that tuberculosis of the mesenteric glands occurs extremely late in guinea-pigs infected through other channels than the intestinal canal and the peritoneal cavity and am absolutely convinced of the value of lymphatic glands as indicators of the path followed by tubercle bacilli in cases which have died before the disease has become too advanced. According to Dr. Woodhead the post-mortem examinations of the bodies of tuberculous children who had died before the age of five and a half years show that in the large majority of them the intestine and mesenteric glands were affected and that in 14 per cent. of those cases the mesenteric glands alone were tuberculous.

A very striking proof of the frequency of infection through the intestine fell under my notice six years ago. Dr. Simcock[3] was investigating in my laboratory the pathology of chronic wasting of children due to improper feeding. He selected 13 cases out of many more in which there was no evidence of tuberculosis in the parents or in the various organs of the children as examined in the post-mortem room. He considered these cases free from tuberculosis. I was not, however, quite convinced. We carefully examined the mesenteric glands of all these children with the object of discovering whether some might not be tuberculous. In 2 of these cases the mesenteric glands showed clear tuberculous lesions under the microscope and in 5 more the mesenteric glands presented lesions suggesting the possibility of incipient tuberculosis.

The presence of two clear cases of tuberculosis among 13 cases carefully selected as free from tuberculosis is specially significant. It is also interesting to notice that the only clear lesions were found in children over ten months of age, as will be seen in the following table:—

Children Dying from Chronic Wasting with no Clinical or Post-mortem Naked Eye Evidence of Tuberculosis.

No. of case.	Age of children.	How long after birth suckled by mother.	Lesions in mesenteric glands.	
			Indefinite.	Tuberculous.
6	3 months.	Not at all.	0	0
1	3½ ,,	1 month.	Slight.	0
2	3½ ,,	2 weeks.	Slight.	0
7	4 ,,	2 ,,	0	0
8	4 ,,	2 ,,	Slight.	0
4	4 ,,	A few weeks.	Slight.	0
5	4 ,,	Not at all.	Slight.	0
9	5 ,,	1 month.	0	0
10	6 ,,	2 months.	Slight.	0
11	10 ,,	3 ,,	0	0
13	10 ,,	Not at all, cow's milk from first.	—	Well marked.
12	11 ,,	2 weeks.	Slight.	0
3	18 ,,	3 months.	—	Distinct.

Out of 4 children above ten months 2 were tuberculous. These numbers are too small to allow one to generalise from them but they assist us to understand the statistics referring to infant mortality. If we now compare with these results the returns given by the Registrar-General in his annual summary for 1897 we find that it is during the first five years of life that most deaths attributable to tabes mesenterica, scrofula, and forms of tuberculosis other than pulmonary phthisis occur. In the case of phthisis it is between the twentieth and the sixtieth year that the greatest number of deaths take place.

It is therefore clear that if infection through the air passages is well proved to be the most important cause of phthisis, the same mode of infection is not equally at work in the production of other forms of tuberculosis. Of the deaths from tuberculosis which occur during the first year of life very few occur during the first ten weeks. On the other hand they become very numerous as soon as children reach the age of six months, at which age a very large number of them have been fed for three, four, five, or even six months on cow's milk. We have also abundant observations to show that calves are exceedingly rarely born tuberculous. A few cases have been reported by various observers. Only three such cases have come under my own observation and I have been able to investigate only one of them thoroughly, through Mr. Holburn's kindness, and found

[3] Vict. M.D. Dissertation, Manchester, 1893.

Deaths from Tuberculous Diseases Registered in London during the Year 1897.

—	Under 1 year.	1 and under 5.	5 and under 20.	20 and under 40.	40 and under 60.	60 and under 80.	80 and upwards.
Tabes mesenterica... ...	619	222	84	35	25	4	—
Tuberculous meningitis	384	576	209	31	8	—	—
Scrofula tuberculosis ...	229	259	181	147	70	34	3
Tuberculous diseases other than phthisis ...	1232	1057	474	213	103	38	3
Phthisis	96	191	576	3547	2862	581	11

Total number of deaths from all causes at all ages in London during 1897, 80·943. Total number of deaths from tuberculous diseases at all ages in London during 1897, 10,984.

that one half of the uterus of the dam was in an advanced state of tuberculosis, a lesion of the uterus which is of rare occurrence. This instance shows only the possibility of the fœtus being occasionally infected by the womb, which is a very different thing from hereditary transmission. We have also the results of the inspection of a very large number of calves, heifers, oxen, cows and bulls. The statistics collected by various observers show that whilst it is difficult to find districts where as many as 2 calves in 1000 are affected with tuberculosis, it is, on the contrary, unusual to find out of the same number less than from 400 to 500 animals over one year old in a state of more or less advanced tuberculosis (see statistics quoted in Report of Royal Commission, 1898). The results of the testing of 39 head of cattle on Mrs. Ashton's estate at Ford Bank, near Manchester, are very instructive in this respect. After discussing the matter with me Mr. G. Ashton determined to have all the cattle kept at Ford Bank tested with tuberculin, all the animals reacting isolated at once, and those not reacting placed in disinfected stables. The diseased cows were to be replaced only by others which would have been proved by the tuberculin test and careful veterinary inspection to be free from tuberculosis. This was carried out by Mr. Locke and by Mr. King with the assistance of Mr. Holburn. Mr. G. Ashton has very kindly allowed me to make use of the results obtained, being himself most anxious to investigate the whole question.

Results of the Testing by Tuberculin of 39 Head of Cattle at Ford Bank, Didsbury, near Manchester, 1898.

—	Positive reaction.	Negative reaction.
5 calves, from 3 to 6 months old, born on the estate, 4 of tuberculous dams, 1 of healthy dam...	0	5
1 heifer, 12 months old, born of healthy dam	0	1
12 heifers, about 2 years old	2	10
3 bullocks, from 18 months to 2 years old ...	3	0
1 heifer, 2 years and 9 months old	1 slight	0
5 heifers, 3 years or a little more	3	2
3 milking cows, from 3½ to 4½ years...	2	1
6 milking cows (one 5 years old and five 6 years old)	3	3
3 milking cows, one "aged," one 7, and one 8 years old	3	0
	17	22

These results give the following distribution of tuberculosis in cattle according to age :—

	Tuberculous.	Not tuberculous.
Under 1 year (5 cases tested)	0	5
One year and under 3 years (17 cases) ...	6	11
Three years and under 5 years (8 cases)...	5	3
Five years and over (9 cases)	6	3
	17	22

Having now given evidence to show that the prevalence of tuberculosis in the young is in most cases due to infection, and that in man this mode of infection is responsible for a considerable loss of young life, I wish to say a word more as to the influence of hereditary tendencies. If children or young animals are extremely rarely born tuberculous, how are we to account for the fact that the disease so very often attacks member after member in the same family? There are two factors which account for this: (1) the children of diseased parents are often weak at their birth and their tissues are less able to stand the fight against the bacilli when these gain entrance into the body than stronger children would; and (2) they are born in infected places and often nursed for a considerable time by persons affected with tuberculosis. Thus these weak individuals, who should be more than any others protected against the risk of infection, are by the fact of their birth in an infected family or house more exposed than stronger children would be. We know, however, for certain that by preventing infection after birth the children of tuberculous parents may be made to escape tuberculosis entirely. The same has been proved over and over again with regard to cattle. The statistics given previously show that infection takes place chiefly during the first year, at a time, therefore, when a large number of children are fed on cow's milk partly or entirely. It has been proved abundantly that by feeding them on tuberculous milk it is easy to produce tuberculosis in most kinds of young domesticated animals.

Can we find any evidence in the milk itself of the presence of the tubercle bacillus? And is the occurrence of the bacillus in milk sufficiently frequent to justify any serious fears in connexion with the use of this article of diet? In dealing here with this question I suppose that results obtained in this part of the country will prove specially interesting. I will, therefore, make use only of the data obtained in my laboratory and relating to milk coming chiefly from various farms situated in the counties of Derbyshire, Lancashire, and Cheshire. The observations I am going to relate were mostly made in the course of investigations instituted by Dr. Hope, the medical officer of Liverpool, and Dr. Niven, the medical officer of Manchester. Dr. Hope's object was chiefly to ascertain what proportion of the milk reaching Liverpool in various ways was tuberculous. He had samples of milk taken at railway stations and various town dairies and sent to various bacteriologists to be examined for tubercle bacilli. Some 50 samples were sent to me in this way.

In Manchester, where I had often the opportunity of discussing the matter with my colleague Dr. Niven, we came to the conclusion that a complete investigation should include (1) the examination of milk from cows certainly tuberculous, with and without tuberculous udders; and (2) that of milk from farms or various parts of the country and also of milk obtained from town byres and dairies. Dr. Niven's object, like that of Dr. Hope, was to find out how much tuberculous milk was used by town consumers in order to ascertain exactly the extent of the danger. Through his kindness, however, I was able to obtain information collected by the chief veterinary inspector, Mr. King, and his assistants, as well as notes regarding the situation and condition of the various farms or dairies from which milk was obtained. In addition to the samples sent to me from Manchester and Liverpool I have obtained myself a number of samples from healthy or diseased cows. During the last four years, and chiefly during the last two, I have thus had to examine some 208 samples of milk, of which 7 were from cows not known to be tuberculous; 22 were from cows nearly all in an advanced state of tuberculosis; 54 were from town dairies; and 125 were from country farms being collected by sanitary inspectors at the railway stations immediately on arrival of the cans from the country. Time does not permit me to describe the methods which I used in this investigation. I have described them in other places.[4] It will suffice to say that all these milks were (1) collected in sterilised vessels and rapidly examined on their arrival at the laboratory; (2) the colour, reaction, specific gravity, and proportion of cream and sediment were noted; (3) the sediment (or slime) and often the cream were separated by centrifugalisation and examined microscopically for dirt, morbid products, various cocci, bacilli, vibrios, yeasts, and moulds; (4) guinea-pigs were inoculated with small quantities of sediment, and, after their death, dissected in order to find whether any lesions had been produced; and (5) the lesions produced in the guinea-pigs were further examined in various ways for the purpose of finding out whether they had been produced by the bacillus tuberculosis or other microbe.

I need not say that an investigation of this kind implies a considerable amount of work. The first half I carried out mostly alone, but in the second half I have had considerable assistance, more especially from Dr. E. J. Sidebotham, and also from Dr. Moore, and lately from Dr. Carver. I have taken the greatest care from beginning to end to avoid as far as possible any source of fallacy. I may tabulate the results obtained as follows :—

A.—UNMIXED MILK COLLECTED IN STERILISED BOTTLES DIRECT FROM THE COW WITH CARE TO AVOID DIRT.

1.—Cows showing no evidence of Tuberculosis.

	Actual No. of samples.	Per cent.
1. *a.* Innocuous milk	6	85·68
b. Milk causing slight local irritation of the tissues near the point of inoculation ...	1	14·28
2. Milk causing severe œdema, ulceration, or suppuration at the seat of inoculation (local infection) or at some distance ...	0	0·0
3. Milk causing general infection, rapidly fatal (from 24 to 48 hours after inoculation) ...	0	0·0
4. Milk causing tuberculosis	0	0·0
	7	100

2.—Cows showing Distinct Evidence of Advanced Tuberculosis, Udder Diseased in 8 Cases and Suspicious in 8 others.

	Actual No.	Per cent.
1. Innocuous	10	45·40
2. Local infection, &c.	6	27·24
3. General infection, &c.	0	0·0
4. Tuberculosis*	6	27·24
	22	99·88

* In all these cases there was evidence of disease of the udder.

B.—MIXED MILK COLLECTED IN STERILISED BOTTLES FROM MILK CANS.

3.—Town Dairies (Liverpool 50 samples).

	Actual No.	Per cent.
1. Innocuous	33	61·05
2. Local infection	13	24·05
3. General infection	5	9·25
4. Tuberculosis	3	5·55
	54	99·90

4.—Country Dairies (Milk collected at Railway Stations in Liverpool and Manchester—Manchester, 93 samples).

	Actual No.	Per cent.
1. Innocuous	70	56·0
2. Local infection	21	16·8
3. General infection	12	9·6
4. Tuberculosis	22	17·6
	125	100

The meaning of these results is very clear. 1. The milk of non-tuberculous cows does not produce tuberculosis. 2. The milk of at least 1 out of every 4 cows much affected with tuberculosis is capable of communicating tuberculosis. 3. The milk coming from country farms which are not under the constant supervision of the health authorities is capable of communicating tuberculosis in 17·6 per cent. of the cases examined. A little more than 1 sample out of every 6 examined proved infectious. This comes from the extreme prevalence of tuberculosis in the country and of the mixing of tuberculous milk with good milk. Dr. Rivers informs me that after receiving the results of my examinations he asked Mr. King to visit the cowsheds from which milk had come which had been found tuberculous. Mr. King found that in all these byres (18) but one there were cows with diseased udders, which, as far as it was possible to ascertain by clinical examination, were probably tuberculous. 4. In towns, such as Liverpool, where cowsheds are under constant supervision, the number of cases in which the milk proved to be infectious was considerably less, being reduced to 5·55 per cent.

[4] Journal of Comparative Pathology and Therapeutics, 1897.

About 1 sample out of every 17 was found capable of producing tuberculous infection. This shows conclusively that improvement may be obtained by using proper measures, but that the sanitary authorities have not so far been able to remove entirely the evil. I wish to point out also that milk is capable of producing serious troubles other than tuberculosis. This is specially true of mixed milk, which, whether it comes from the country or from the town, is capable of producing a very serious form of infection—in fact, a septicæmia in some 9 per cent. of the cases examined. In addition to this from 16 to 24 per cent. of the samples are capable of producing considerable irritation of the tissues.

In a previous communication I have shown that these noxious properties were mostly due to the contaminations of the milk either at the time of milking or afterwards by the dirty vessels in which it is kept. The microbes thus introduced into the milk are of various kinds and when the temperature is high and the milk kept too long certain noxious bacteria multiply rapidly and render the milk dangerous. These bacteria may produce an infection on their own account, or, by irritating the bowel, prepare the way for the penetration of the tubercle or other bacilli. To test the truth of this supposition I have during the last summer kept in ice all the milk which had to be examined more than 6 or 8 hours after milking, with the result that only 1 out of about 20 specimens so treated has given rise to general septic infection. I show you plate cultures of milk proving the effect of cold on the bacteria in milk. You can see that milk kept four days in ice contains fewer bacteria than it did half an hour after milking.

You may ask whether inoculation of milk into the tissues is a proper test to apply in estimating the value of an article of food which in the natural course of things has only to pass into the alimentary canal. I have not asserted that all the samples of milk which I have found to produce disease when injected into the tissues would necessarily have produced disease in the human subject, but what I intend to convey is that unsound milk has properties which are not present in good milk and that these properties are of a dangerous nature. Milk may be obtained which is capable of standing the test and we have seen that milk when collected so as to avoid dirt, and kept under conditions not favouring the multiplication of bacteria, never produced a general infection rapidly fatal. This being the case there seems to be no necessity for allowing milk with unpleasant properties to reach our markets. The fact that about 60 per cent. of the milk supplied by our dairies is perfectly innocuous shows that it is not impossible to supply absolutely wholesome milk. Whether therefore the tests I have used are severe or not they show that milk of two distinct qualities is sold to the consumer: (1) milk which cannot produce any form of disease even under the conditions most favourable to the production of disease; and (2) milk which under the same conditions produce various forms of disease, some extremely severe. I think everybody will admit that this second quality is not desirable. After considering the danger let us consider the remedy.

On a previous occasion [5] I have expressed an opinion as to the public measures which seemed to me to be necessary for dealing adequately with tuberculosis from the public and administrative point of view and I can only repeat now what I said then.

1. The first general measure which can be recommended for the purpose of combating tuberculous infection through milk is in the hands of the consumers; it consists in boiling all the milk used. There is a strong prejudice against this boiling of milk. For my own part I think the defects of boiled milk have been exaggerated. I know families who on my recommendation have drunk nothing but boiled milk (except in their tea) for the last 12 or 13 years. I have watched children who have practically never drunk any unboiled cows' milk from the time they were weaned to the present day—i.e., in one case over 12 years and in the other case a little less—and these children have never suffered from the use of boiled milk and prefer it to unboiled milk. The great objection, however, to this easy remedy is that it does not protect us against tuberculous cream, butter, and cheese. Nor does it mitigate the dangers of infection due to the presence in our midst of so many tuberculous animals and the losses caused to the farmers by tuberculosis.

2. A second method of dealing with the milk so as to protect the consumer is to analyse samples from time to time and to reject from our markets all milk which is not free from infectious properties. This method is not a practical one; it is easy to detect common adulterations by simple chemical tests, but it is another thing to find out whether a sample of milk can produce tuberculosis or not; this may take days and meanwhile the consumer is not protected. This method can only be used for the purposes of checking other preventive measures and for that purpose it will always prove a useful adjunct.

3. We must turn to the actual source of milk—i.e., to the cow—and see that it is not allowed to contaminate our milk-supply. This means systematic inspection of our cowsheds and milch cows by competent men able to detect tuberculosis even before it has produced symptoms obvious to all. A careful veterinary surgeon can now by the application of the tuberculin test combined with a thorough inspection almost always determine whether a cow is tuberculous or not.

As it is impossible to say when the udder of a tuberculous cow will become diseased, the untreated milk of all tuberculous cows should be excluded from the market. After being sterilised by boiling or otherwise, this milk might still have a good commercial value. This method of inspection would free our markets from the greater part of the tuberculous milk which at present reaches them, yet this would do little towards stamping tuberculosis out. Tuberculous cows and tuberculous sheds would still remain a source of infection. It would therefore be necessary to (1) separate the tuberculous cows from the healthy ones; (2) to fatten all tuberculous cows for slaughter whenever the disease has not reached serious proportions and slaughter those in which the disease is advanced; (3) to disinfect thoroughly infected sheds; and (4) to improve their construction so as to allow of their being thoroughly cleaned, lighted and ventilated. These measures, although they would deal efficiently with tuberculosis as it exists at present, would certainly not prevent the action of fresh sources of infection.

4. This makes it evident that steps should be taken to prevent the introduction of tuberculous cattle into any county where it was desired to deal efficiently with tuberculosis: (1) all cattle brought into the county from neighbouring counties or from abroad should be examined first by veterinary surgeons acting under the direction of some central county sanitary authority; (2) all cattle kept in the county should also be registered and marked, so that it should be easy to ascertain which animals have been registered, inspected, and tested; (3) all cowsheds should then be inspected at least twice a year and the few tuberculous animals which would have escaped previous inspection weeded out; and (4) the breeding of healthy cattle should be encouraged and calves fed on sterilised milk would be easily protected against chance of infection if the preventive measures above mentioned were taken.

5. The presence of tuberculous servants should not be tolerated either in the sheds or dairies. Milk pails and cans should be kept scrupulously clean. Of all the measures I have mentioned two seem to me essential: 1. The systematic and periodical inspection of cowsheds and herds for the purpose of weeding out tuberculous animals. To be efficient such an inspection should be thorough and include all the cattle kept within definite administrative areas. For the first year or two compensation should be given to the farmer for losses incurred except in cases of gross or culpable neglect on his part. After this transitional period the presence of a case of advanced tuberculosis in a cowshed should make the owner liable to a penalty. 2. The testing of all cattle brought into, say, a given county, so that fresh sources of tuberculosis should not be introduced. If such methods were adopted it would then be only right to see that foreign dairy produce is not allowed to flood our market unless good guarantees were obtained that proper measures have been taken to safeguard the consumer.

It does not seem probable that general measures of the nature I have described are likely to be carried out in England for some considerable time to come, and probably the work will be left to private initiative. This will render the stamping out of cattle tuberculosis a much slower process than it might otherwise be. It seems to me, however, that work like that done on Lord Vernon's estates if carried out in various parts of the country must ultimately induce a general demand for wholesome milk, which demand will probably be supported by better prices. This demand will ultimately force the farmer to free his stock from all diseased animals, collect the milk and forward it under

[5] The Journal of Comparative Pathology and Therapeutics, June and September, 1897.

conditions which will insure the safety of the consumer. At the present time there are only a few who realise the importance of this, and to obtain pure milk the dairy owner must pay higher prices for pure than for impure milk. The consumer should certainly take his share of the expense. Dr. Livesay, who has so ably directed the work done at Sudbury, informs me that a number of farmers on the Sudbury estate have agreed to submit to certain regulations ensuring the exclusion of tuberculosis and purity of the milk. And as compensation the farmer receives 1*d*. more a gallon for this tested milk than he would for ordinary milk. I think the time will come when this inducement will be unnecessary, for the exclusion of tuberculosis will be found to be a source of profit instead of being one of apparent loss, as it seems to be at present.[6]

We have seen that the proportion of cows affected with tuberculosis increases rapidly with age. After the age of three—that is, as soon as cows become useful for breeding and dairy purposes—it is not an exaggeration to say that more than half of them are under the present conditions doomed to become tuberculous. And of this half a certain proportion will rapidly reach the wasting stage, after which they will lose much of their value, if not the whole, as beef producers. Now a young cow with slight tuberculosis properly fattened has a very good value as beef. Were it sold to the butcher at the proper time and replaced by another cow free from tuberculosis the immediate loss to the farmer would be the difference between the price of the beef and of the milking cow. But had the farmer waited longer he would have had a possible loss due to the diminished quantity and lowered quality of milk (for a time the milk production is often not unfavourably affected by tuberculosis) and when ultimately he found it necessary to have the cow slaughtered on account of advancing tuberculosis the value of the cow as beef would have considerably diminished or entirely vanished. In addition to this each tuberculous cow is capable of infecting a number of other healthy animals. Therefore by having his cattle slaughtered as soon as tuberculosis becomes evident the farmer is exposed to an immediate loss which is probably smaller than the prospective loss he would incur did he keep the tuberculous animals.

On the other hand, after having had his tuberculous cattle slaughtered and his stable thoroughly disinfected he may arrange to buy none but cattle which have been certified by competent veterinary inspectors to be free from tuberculosis. He may have to pay a little more for cows bought under these conditions, but the ultimate value of his stock will be considerably increased, for only a small number of his cattle will develop a slight degree of tuberculosis, and this being detected in time will not cause him any serious loss.

In the fight against tuberculosis in cattle by private enterprise unsupported by the State it seems to me that the following lines are clearly indicated:—

1. Healthy cowsheds, well lighted and ventilated, easily cleaned, arranged so as to separate the animals as completely as possible from each other and to prevent the food and litter of one from being contaminated by others. Good water-supply. After discovery of a tuberculous animal thorough disinfection of its stall and if possible of the whole shed.

2. Isolation sheds of the same kind for cattle found to be affected with a moderate or slight degree of tuberculosis.

3. Stalls well isolated from the others might be provided in this shed for animals which have not been tested and have to be kept in quarantine until tested, or better still a special testing shed frequently disinfected might be provided.

4. Immediate slaughter of all cows in an advanced state of tuberculosis.

5. Fattening of cows with moderate tuberculosis, these cows not to be allowed to come again at any time in contact with the healthy ones.

6. Any dairy produce from these tuberculous cows to be sterilised. If butter be made the cream should be treated for some time at 85°, which does not interfere with the making of good butter (Bang). Tuberculous cows should, however, be fattened as soon as possible and their milk used as short a time as possible.

7. Tuberculous cows with tuberculous udders are usually in a state of advanced tuberculosis, but in any case a cow with tuberculous udder should be slaughtered at once.

8. All calves to be fed from the first on sterilised milk. The thoroughly sterilised milk of tuberculous cows might be used for this purpose.

To avoid the other sources of deterioration which I have mentioned:

9. The udder and milkers' hands should be kept absolutely clean.

10. The milk cans or pails should be washed with boiling water or sterilised by steam.

11. This milk should be cooled immediately after being milked and its temperature kept below 40° F. until it is treated in the dairy (by filtration, separation, sterilisation, &c.).

12. Milk which has not been sterilised and which has to be sent by rail from the dairy to a distance should be kept by packing in ice or otherwise at a temperature below 40° F. if possible, until it reaches the consumer. The same precautions with regard to cooling apply to all milk which cannot be consumed within a few hours—say, 8 or 10 hours at the most—from the time of milking.

13. The authorities should be asked to regulate the importation of foreign milk and dairy produce with the view to ensure that the precautions above mentioned have been duly taken to ensure the wholesomeness of these products.

14. The authorities should be asked to find the means to prosecute and punish adequately all kinds of neglect rendering milk dangerous to health so as to place the farms and dairies where proper precautions are taken on a fair footing in the general competition.

[6] Thus in Massachusetts, where an attempt has been made since 1894 to fight tuberculosis in cattle, it has been found that although the preventive measures have not been applied generally and thoroughly enough to insure a diminution in the number of cases, yet cases of generalised tuberculosis have diminished to a considerable extent. Among animals slaughtered after being shown to be tuberculous by the tuberculin test it was found that in 1896 there were 32·6 per cent. of them affected with generalised tuberculosis, in 1896 there were 26·1 per cent., and in 1897 3·5 per cent.

THE PLAGUE IN CALCUTTA.

BY FRANK G. CLEMOW, M.D. EDIN., D.P.H. CANTAB.

MORE than three months have now (August 4th) elapsed since the presence of plague in Calcutta was established beyond a doubt. The disease has in that time shown little sign of becoming widely epidemic or of causing such disastrous havoc as followed its appearance in Bombay, Poona, and elsewhere. The daily number of fresh cases has only on one occasion risen so high as 8, and has usually varied between the limits of *nil* and 3 or 4. The total number of cases appearing in the returns up to, and including, July 31st, 1898, has been 190, and the daily average since the beginning of the outbreak has been less than 2. During the past few weeks there has been a distinct decline even in this small number of cases, and for several days recently there has, so far as plague is concerned, been a clean bill of health. This in itself is most satisfactory and to some extent reassuring for the future. It is obvious, however, that so long as even single cases are occurring they are evidence that the infection has not completely died out or quitted the city, and while that is the case there cannot but be grounds of apprehension as to the course the disease may pursue later, when the advent of the cool season must favour the spread of any remaining infection. For the plague infection made its appearance in Calcutta at a time of year when, if we may judge by the experience of previous epidemics, the seasonal conditions were not favourable to its spread. As a rule, though the rule is not without exceptions, the disease has only become widely epidemic in India in the cool part of the year—that is to say, between the months of November and March. This was the case in the very severe outbreaks in Bombay, in Poona, in Karachi, and in Thana. In certain districts the climax of an epidemic has fallen rather later—in the month of April or even so late as May, when the hot season is fully established. This happened in Surat, where the outbreak reached its highest point in April; in Kolaba, where the mortality was highest between the last week in March and the first week in May; and in the Janjira State, where May was the worst month. In the Navsari division of the Baroda State the main

period of the epidemic was from the middle of March to the end of the first week in May. In Cutch Mandvi and in Hyderabad the most fatal period of the outbreak was in each instance in May. It is important, however, to note that in all these epidemics the disease was already established in the town or district some time before the hot season set in and it has not in a single instance happened that the infection, introduced into a new locality so late as the month of April, has started an epidemic in the hot season. The infection was, it is believed, introduced into Calcutta in April of the present year. The behaviour of the disease, therefore, in remaining sporadic throughout the hot and so far throughout the rainy season, is such as might have been anticipated from its behaviour elsewhere, while on the same grounds there is every reason to be prepared for a much more extensive outbreak when the cool weather sets in.

The course of the present outbreak in Calcutta has presented several points of interest. The earliest recognised case of plague occurred on the night of April 16th, 1898, when a sudden death from fever accompanied with swelling of the glands of the left groin took place in Kapalitola, a crowded locality near Bow Bazar, in one of the most insanitary districts of the city. The man's name was Issur Chunder Dey. The clinical history and the post-mortem appearances showed evidence which was regarded by the health officer of Calcutta and by the leading medical advisers of Government as highly suspicious of plague. A most careful bacteriological investigation was made; pure cultures of bacilli were obtained from the bubo and these were found to give all the reactions regarded as characteristic of the plague bacillus. To make assurance doubly sure some of the growths were sent to M. Haffkine in Bombay, and his report confirmed the view that the case had been one of true bubonic plague.

While the case of Issur Chunder Dey derives considerable importance from the fact that it was the first to be diagnosed as plague and that on the result of the investigation of this case ultimately hinged the public recognition by Government of the existence of plague in Calcutta, there is reason to believe that it was not the first case of the disease in this city. 2 days earlier than its occurrence—i.e., on April 14th—2 patients with symptoms characteristic of plague had been admitted to the Medical College Hospital. Both of these patients died. 1 of them, moreover, had been in contact with a patient who had been admitted to the same hospital as early as March 30th, and who had died after an illness which presented many features suggestive of plague. These cases are important as they illustrate the difficulty of assigning a definite date to the appearance of plague in a city, a point to which reference will again be made later. On April 17th 3 other persons were discovered in Kapalitola with symptoms of plague and of these 1 died. A *dome*[1] who assisted at the necropsy on Issur Chunder Dye and accidentally pricked his finger, was the next to sicken and after a long fight for life he ultimately succumbed to secondary pulmonary affection. Before the end of April a total of about 40 cases of plague had occurred and the infection had shown its presence in parts of the city at some distance from the area originally infected. The latter continued to furnish cases, and a second area, around the General Market, began to rival it as a plague centre. Elsewhere only isolated cases were occurring. From that time onwards there has been a slow but steady spread of the disease until there are now only 7 out of the 25 wards into which the city is divided which have not at any time returned a case of plague.

The above facts, so far as they relate to the early cases of the disease in Calcutta (I am indebted to the courtesy of Dr. Nield Cook, the health officer of Calcutta, for many of the details of these cases), were publicly announced by the secretary to the Lieutenant-Governor of Bengal at a meeting of the Bengal Legislative Council held in Calcutta on April 30th. This was the first public recognition of the existence of plague in the city. It will be noted that an interval of fourteen days had elapsed between the date of the first recognised case and the date of the announcement. But it must not be thought that the authorities had in the meantime done nothing to cope with the threatened danger or that the public were ignorant of what had occurred. Both the authorities and the native populace had been equally prompt, though in exactly opposite directions, in taking action on the first breath of suspicion that plague had appeared in the city. The authorities, as already related, took all possible steps to ascertain the exact cause of death in the first case, and without waiting for complete confirmatory evidence—which could only be forthcoming after the lapse of some days—proceeded to act on the supposition that the cause of death had been plague and to take precautionary measures accordingly. The house where the death occurred was thoroughly disinfected, all persons who had been in contact with the patient were removed to a segregation camp, and all articles likely to convey infection were burnt, compensation being paid to the owners. The native populace, on the other hand, the moment it was known that a suspected case of plague had occurred, proceeded incontinently to lose its head and to give way to as violent an attack of panic as has perhaps ever been seen in modern times. This showed itself, as usual in such cases, in a general flight of about one-fourth of the population, in strikes and riots, in the murder of several quite inoffensive persons, and in an attempted reign of terror which fortunately proved abortive. For days together the approaches to the railway-stations were blocked by enormous crowds of struggling natives striving to reach the platforms. The rush to leave the city reached its height on April 29th and 30th, and it has been stated that on those two days alone between 40,000 and 50,000 people left Calcutta. The exodus continued at a slower rate for many weeks, and the estimate generally accepted that some 200,000 people in all fled to the country is probably not above the truth. The wildest rumours were in circulation, attributing the most horrible motives and intentions to Government and particularly to its medical officers. The mildest of these stories was to the effect that the medical men in charge of the plague hospitals were instructed to quietly kill every patient admitted. But no story or rumour was too grossly ridiculous to find ready credence. Unfortunately the native press did little to allay the alarm, and in many instances rather encouraged it by publishing articles which only fanned the flames of panic and disaffection. Interested persons fomented the panic, and the jewellers and goldsmiths are said to have made a rich harvest in the form of bracelets, anklets, and other jewellery purchased from their fellow natives whose sole means of escaping from the city was by converting this portable wealth into money. The scare caused by the fear of plague was succeeded by a second access of panic which may be termed the "inoculation scare." It followed immediately upon the proclamation of Government which aimed at promoting general, but of course voluntary, inoculation with M. Haffkine's prophylactic. It was characterised by another crop of equally wild and gross rumours, and it unfortunately led to some very terrible consequences. Several quite innocent persons were murdered by the mob, and many others were severely mauled merely because the cry had been raised that they were *ticca-wallahs*—the native word for inoculators. A little later came the "ambulance scare." The appearance of one of the municipal ambulances in the street was the sure cause of collecting a crowd of excited natives, and on two occasions an ambulance was set upon by the mob and those in charge of it injured, while on one of these occasions the vehicle was completely destroyed and the remains of it were set on fire in the street. At this period patients were removed to hospital under an escort of police armed with *lathies* or long bamboo rods. For a while all of us who were in any way connected with the plague organisation were in more or less danger of personal violence, and it was not safe to go about the city without a revolver. Few Europeans in this city, whether connected with the plague operations or not, failed to provide themselves with this weapon of defence and in a short time it was scarcely possible to purchase a revolver in the whole of Calcutta. This scare came to a climax on Saturday, May 21st, when Dr. Ronald Laing, one of the district medical officers, was attacked by a mob in a native house which he was inspecting. He was compelled to fire his revolver three times, twice with fatal effect, before the mob retired. The incident produced a deep impression and there was a very general feeling that the community owed a debt of real gratitude to Dr. Laing for having by his prompt

[1] *Domes* are natives of very low caste employed in hospitals to do the mechanical part of post-mortem examinations. They often develop great expertness in opening the body and removing the organs. 5 of these poor fellows have unfortunately contracted plague in Calcutta as the result of wounds or scratches inflicted at necropsies on plague patients. The fact is of considerable diagnostic importance, as instances of other diseases being thus contracted by these men, who do not appear to mind making necropsies with open cuts or scratches on their hands, are said to be of very rare occurrence.

action taught the more excitable and turbulent class of natives a much needed lesson. The lesson seems to have been at once taken to heart, for from that time the tendency on the part of the people to interfere with the medical staff in the course of their duties almost at once disappeared. This is not the place to dwell upon the many inconveniences which accompanied this state of panic—the suspension of business, the strikes among labourers of almost every class and the straits to which many people were reduced by the flight of their servants. Anyone who has lived in India and learnt how greatly one's happiness here is dependent upon the faithful discharge of their duties by punkah-pullers, bearers, and table servants, will readily realise the discomfort which a general flight of domestic servants would be capable of causing.

Before proceeding to discuss the further course of the outbreak it is of importance to recall the fact that this is in all probability not the first occasion upon which the plague infection has made its appearance in Calcutta in recent years. Very shortly after plague broke out in Bombay in the autumn of 1896 a group of cases occurred in Calcutta which gave rise, it is said, at the time to considerable controversy and no little alarm. The cases are fully described in the Annual Report of the Health Officer of Calcutta for the year 1896–97.[2] Dr. Simpson, the late health officer, there writes that, as a rule, epidemic diseases prevailing in Bombay sooner or later find their way to Calcutta, and that "in October, 1896, a case of glandular sickness with fever occurred in Howrah in a patient who had arrived from Bombay." Howrah is a separate municipality, divided from Calcutta only by the River Hooghli. The case was regarded by Dr. Simpson as a case of pestis ambulans, but the Medical Board[3] investigating the case later came to the conclusion that there was no evidence to consider this a case of true bubonic plague. Then there cropped up (the report continues) "a group of similar cases, one of which was fatal, each with fever, glandular enlargements, and presenting bacilli in the blood." Then a case of bubonic fever occurred in a child named Giga and in the same house a sickly-looking rat was seen. The rat was in a dazed condition and was easily caught and killed. On examining this animal "the glands of the left groin were found to be enlarged, congested, and agglutinated together. The internal organs were generally congested; diplo-bacteria were found in the blood and internal organs and cultures from these gave growths resembling specimens of plague bacilli in rats received from Bombay. Healthy rats were examined, but no bacilli were found in their organs." It is of interest to note that the occupants of the house where this rat was found were Marwaris, who received goods, clothing, and yarns from Bombay. A week later it was reported that an unusual mortality among rats was occurring in two grain shops in a street called Burtolla-street. As many as a hundred dead rats were found in one day in one shop alone. Some of these animals were examined and exactly the same pathological changes were found in them as have just been described above. In both shops "the floors were dug up, the place flooded with disinfectants, and any rats found were killed, after which no further cases occurred. A few sick rats were found in adjoining houses and these houses were also thoroughly cleansed and disinfected and the rats destroyed."

Reviewing these facts there seems to be little room for doubt that so long ago as October, 1896, the plague infection was introduced into Calcutta; but, whether as the result of the measures taken or from the conditions then met with proving unfavourable to its spread, there was no extension of the disease. If the infection which thus manifested itself for a brief period was indeed the true plague infection (it is right to recall that many highly qualified observers did not and do not regard it as such) the fact that it did not extend is a remarkable one; and it is the more remarkable in that the time of year at which it appeared was the time of year when, as has been already shown, plague, if introduced into an Indian city, is most likely to spread and become widely epidemic.

To return from this digression. The further course of the present outbreak has been as follows. After a marked rise in the number of cases at the end of April (17 fresh cases occurring in three days) there was a sudden pause and in the first week of May only 4 fresh cases were reported. The following table completes the statistics of the outbreak:—

Week ending	Number of fresh cases reported.	Week ending	Number of fresh cases reported.
May 7th	4	June 25th	19
,, 14th	8	July 2nd	23
,, 21st	10	,, 9th	17
,, 28th	9	,, 16th	12
June 4th	15	,, 23rd	4
,, 11th	16	,, 30th	4
,, 18th	19		

These figures, it will be observed, show a distinct rise to a small maximum followed by an equally distinct and more rapid fall. They are, however, obviously too small to lead to any conclusion based solely upon them. It may or may not be of significance that the highest part of the small curve formed by these figures fell in the weeks immediately following the breaking of the monsoon and setting in of the rainy season. June 15th is regarded here as the average date when this looked-for event may be expected to happen, and this year it came very near to that date. Judging from the present season it does not seem to be very easy to fix an exact date for the commencement of the rains. There had been many heavy showers at intervals throughout the great heats of May. Towards the second week of June there was a gradual but distinct change in the weather; the clouds gathered more and more ominously each day and the showers became more frequent, until by about June 16th or 17th it was very generally admitted that "the monsoon had broken" and the long rainy season fairly begun. While on the subject of weather it should be added that the hot season this year in Calcutta was, in the opinion of most people, an exceptionally cool one. The showers in May already referred to certainly did much to relieve us from the burden of heat and glare of sun which at times during that month had been very trying. Calcutta is far from being among the hot places of India; its average temperature is a moderate one when compared with that of such furnaces as Jacobabad or Mooltan, where the thermometer in the hot season may remain for days together above 120° F. in the shade. From personal experience I can speak only of the second half of the hot season in Calcutta. During that period I did not see the thermometer rise on any occasion above 96°, though on one excessively close day the return from the meteorological office recorded 99° in the shade. But, though the climate of Calcutta is not an excessively hot one, it is an excessively moist one. The coefficient of humidity, even in the hot and dry season, is seldom less than 75, and is more often between 80 and 90. Since the rains have set in there has been an appreciable and welcome change of some 10° in the height of the thermometer, which instead of averaging as before between 90° and 95° now usually stands between 80° and 85°.

The plague infection made its appearance in Calcutta in the earlier half of the hot season. From the moment of its appearance two important problems presented themselves for solution: firstly, whence had the infection come? and secondly, having come, what would its behaviour be? The first problem has up to the present proved insoluble. The earliest patients, so far as could be ascertained, had had no communication directly or indirectly with Bombay, Hong-Kong, or any of the other places where plague was or had been epidemic. There is, however, some interesting evidence, which will be discussed later when speaking of the disease in rats, tending to show that the infection may have been brought to Calcutta by ships trading from some infected port. The second question has been partially answered: the infection has spread in the course of rather more than three months to nearly all parts of the city; worse in some parts (particularly Wards 8, 10, and 13, all more or less central wards), more slight in others. In five of the twenty-five municipal wards into which the city is divided there has been only a single case of plague reported, while seven (all with one exception either suburban wards or wards mainly inhabited by European residents) have been fortunate enough to escape altogether.

A further and equally important question remains for solution, What will the disease do when the cool weather sets in and conditions arise which are known to be favourable to the extension of plague? Will it become widely epidemic

[2] A still more detailed account of these cases will be found in Parliamentary Paper, C. 8368: "Papers relating to the Outbreak of Bubonic Plague in India up to March, 1897."

[3] The Medical Board was appointed in October, 1896, to supervise all plague measures in the Bengal Presidency. It was the predecessor of the present Plague Commission appointed last November.

in Calcutta as it did in Bombay, Poona, and elsewhere? will it disappear altogether? or will it remain as at present, the cause of only occasional sporadic cases?

In this connexion a comparative study of the rapidity with which the infection of plague in past epidemics has gained a hold upon a given community may prove interesting and may throw some light upon the question at issue. It may be stated in general terms that all epidemics of plague commence with a period in which the disease presents itself in isolated, sporadic cases. This period is of uncertain length and may vary from a few weeks up to many months. To take examples, it will probably be admitted that the three greatest epidemics of modern times have been the Great Plagues of London in 1665–6, of Marseilles in 1720–1, and of Moscow in 1770–1. The recent outbreaks in Bombay, Poona, and Karachi, severe as they have been, cannot be compared with these in regard to the number of persons attacked, but they are of more importance in the present connexion from the fact that they occurred recently and in India, and may therefore be included in this rapid survey.

In the Great Plague of London the earliest known case of the disease is supposed to have occurred at the end of November or beginning of December, 1664, but it was not until the end of May or beginning of June, 1665, that the weekly return of cases of plague began to be seriously high, and the main period of the epidemic was during the summer and autumn of that year.[4] The presence of the plague infection throughout the winter of 1664–5 is evidenced by the appearance of "plague" in the mortality returns of several parishes and probably also by the unusually high death-rate which prevailed in London throughout the winter. In this great pestilence, therefore, the sporadic period preceding the great epidemic outbreak was probably of about six months' duration. In the Great Plague in Marseilles this period seems to have been shorter. The infection is supposed to have been brought to the city by a ship from Syria which arrived at Marseilles on May 20th, 1720. Cases of plague had occurred on board, and on June 22nd cases began to occur among the porters employed in unloading the ship, and very shortly after the plague seems to have become widely epidemic.[5] In the Great Plague of Moscow the early course of the epidemic was remarkably similar to that of the Great Plague of London. In Moscow the earliest cases occurred in October or November, 1770, and it was not until the following spring that the disease began to be extensively epidemic. Here, as in London, cases of plague occurred throughout the winter and there was a distinct rise in the general mortality.[6]

With regard to the first appearance of plague in Bombay in 1896 some evidence has been recently published, from which it would appear that the sporadic period was of much greater length than has been hitherto supposed. In the extremely valuable report upon Plague in India, issued by Government in April last, it is written[7]: "Several circumstances point to plague having prevailed in Bombay for some time before its existence was recognised. In August cases of fever with glandular swellings had been attended by several medical practitioners, cases of fever accompanied by pneumonia had been reported to the executive health officer, and a death was actually registered on the 31st August as due to bubonic fever. These circumstances failed to arouse an alarm of plague, as a type of fever with glandular swellings has, it is said, been for years known in Bombay. Again, it is stated by Mr. Snow, the Municipal Commissioner, that 'when plague broke out, several native practitioners of the first standing acknowledged that from the end of the hot weather in May onwards they had come across several cases of peculiar fever which entirely puzzled them and usually ended fatally. It does not, however, appear that the bubonic swellings in such cases were apparent in a marked degree, and little further thought appears to have been given to the matter, which is no wonder considering the various obscure forms of plague noticed in the epidemic.'" The great epidemic rise of plague in Bombay began at the end of September. If the cases just referred to were in truth early cases of plague, the sporadic period of the disease may be said to have lasted for four months. An increased mortality rate began to prevail in the city from the end of August. In Poona "the infection appears to have taken hold of the city early in January. It spread steadily throughout January and February, and culminated in the middle of March." In Karachi cases of plague occurred at least as early as the beginning of December, and the great epidemic rise began in the month of January.

To sum up, in at least 3 of the 6 epidemics here briefly reviewed the disease remained in a sporadic form before it became widely epidemic for a period to be reckoned by months. It should, however, be added that in each of these epidemics this period was marked by a more or less striking rise in the general mortality. This has so far not been the case in Calcutta, and it is perhaps the most hopeful feature in the present outbreak that the general mortality of the city has remained comparatively low throughout; and even when allowance is made for the greatly reduced population as a result of the general flight there does not appear reason to believe that there has been any great increase of mortality among the remainder. Unfortunately, the mortality statistics of any Indian city are open to many sources of vitiation. Bodies are frequently burned or buried without any medical certificate as to the cause of death. The returns from the burning *ghâts* and cemeteries are acknowledged to be never more than approximately correct, and there are strong grounds for suspicion that the rupee is quite powerful enough to secure the disposal of a body without any return or entry of it at all being made. It is therefore more than probable that many cases of, and deaths from, plague have occurred unknown to the authorities. There are other than *à priori* grounds for this belief. For example, attention has recently been called to the extraordinary predominance of males over females in the returns of cases. The proportion of the sexes in the general population of Calcutta was, according to the census return of 1891, as follows: males, 447,000; females, 235,000, or about 53 females to every 100 males. There are many reasons[8] for believing that this proportion is much below the truth and that the true ratio of the two sexes is much more nearly one of equality than these figures express. But in the 190 plague cases which have appeared in the returns the proportion of males to females has been immensely higher. Thus among Hindoos the distribution of the sexes has been 87 males and 18 females; among Mohammedans, 48 males and 8 females; and among Eurasians, 13 males and 11 females. Expressed in percentages, there have been for every 100 male cases, among Hindoos only 20 female cases, among Mohammedans only 17, and among Eurasians as many as 91. So far as is known of the general mode of spread of the plague infection there does not seem any very good reason to suppose that men are more exposed to the infection than women. On the contrary, since plague is generally regarded as a "house disease," and one in which the soil contains and conveys the infection, it would appear probable that women in India are more exposed to the infection than men; for not only are they more confined to the house, but one of their most constant occupations appears to be the cleansing of brass and other vessels with earth scraped from the floor of their huts or from the road outside. There is therefore constant opportunity in the case of Indian women to come in contact with the plague infection; and unless there is some very excessive degree of susceptibility to plague in men over women, the figures just quoted may, with much reason, be held to point to concealment of a number of cases occurring among females. No such excessive degree of susceptibility has been proved elsewhere and, moreover, it will be observed that among Eurasians, against whom no charge of concealment of cases could possibly rest, the cases have been almost equally divided between the two sexes.

In discussing above the early history of the epidemic in Bombay reference was made to the statement that a type of fever with glandular swellings had been known for years in Bombay. This raises a point of no little interest and

[4] Defoe: Journal of the Plague Year.
[5] Encyclopædia Britannica: Article on Plague by Dr. J. F. Payne.
[6] Practitioner, October, 1894: Notes on some Past Epidemics of Plague in Russia, by the present writer.
[7] The Plague in India, 1896, 1897: compiled by R. Nathan, I.C.S., Simla, 1898, vol i., p. 108.

[8] "According to the census report of 1891 to every 1000 males there are returned only 958 females [i.e., for the whole of India]; and the tables show that there are in the country fewer females than males to the number of, speaking roundly, 6½ millions. The deficiency is greatest in the Punjab, N.W. Provinces, and Rajputana. In Bengal, Madras, and Upper Burmah, however, females are in excess to the extent of something under three-quarters of a million. The conclusion arrived at with regard to the deficiency of females is that it is to a large extent due to deliberate concealment and deliberate omission from the census returns." *Vide* editor's footnote on p. 213 of the last edition (1897) of that wonderful storehouse of information, "Hindu Manners, Customs, and Ceremonies," by the Abbé Dubois. In 1896 the proportion of registered female births to registered male births in Calcutta was 87·5 to 100.

importance in connexion with the present outbreak in Calcutta, for here the same assertion has been widely made, and during the early weeks of the outbreak there were many practitioners of high standing and repute who maintained the view that the cases returned as plague were not cases of plague at all, but cases of the endemic fever with buboes. Almost without exception these gentlemen have since admitted that, in view of the clinical character and high mortality of the recent cases, they have rightly been regarded as cases of plague. The occurrence of this endemic disease is, however, of importance, as it must add one more difficulty in the way of fixing an exact date for the first case of an epidemic of plague, to which reference was made earlier in this paper. The evidence for the existence of such a disease is conclusive, although it is a remarkable fact that at one of the largest of the Calcutta hospitals no such cases are ever seen.[9] It is based upon the assertion of many practitioners in Calcutta that a certain number of cases with these characteristics are met with in general practice every year, and upon statistics of a similar disease among English troops in Fort William, where every year an average of between 30 and 40 cases of fever with glandular swellings occurred in the years 1890-6 inclusive.[10] No published description of this disease appears to exist, but, so far as may be gathered, it would seem to differ from plague in its being altogether of a milder character, in its low rate of mortality, in the fact that suppuration of the glands is the exception rather than the rule,[11] and in the absence of any concurrent disease in rats. The bacteriology of the malady has not, it would seem, been studied.

Frequent reference has been made in the course of this paper to the appearance of a disease among rats preceding and coincident with the appearance of plague in man. It must now be accepted as one of the established facts of medicine that in almost all outbreaks of human plague rats are affected by a similar disease both before and during the epidemic. The evidence that the two diseases are the same is of exactly the same character as that which has established the identity of human and bovine tuberculosis, and there seems to be but little more reason for suspension of judgment in the one case than in the other. It may therefore be accepted that plague in man and plague in the rat are, as far as our present knowledge of the two diseases goes, one and the same disease. Evidence has been published[12] that the disease may attack other animals than the rat, such as dogs, pigs, pigeons, and domestic fowls. I have no personal knowledge of such an occurrence (with the exception of a very doubtful case in a dog),[13] and the present notes are therefore confined to the disease in rats.

There is, as already stated, some interesting evidence pointing to the possibility that rats were the means of introducing the plague infection into Calcutta. Before the date of the first recognised case of plague in man intimation was received at the Health Office that a number of dead rats had been found in an office situated near the river; and a little later other dead rats were found in a street close to and parallel with the river and in the warehouses of a shipping company near to the wharfs where ships unload. The occurrence seems to have been so unusual as to have at once attracted attention and the premises were cleansed and disinfected. Some of these animals were examined at the municipal laboratory and cultures of the plague bacillus were obtained from them. Ever since the beginning of the outbreak dead rats in large numbers have been found in various parts of Calcutta but more particularly in and near houses where cases of human plague have occurred. In a large city like Calcutta a certain number of dead rats will always be found, but during the past three months the number has been unusually large and there can be no question that this has been due to the occurrence of a plague epizoötic among these rodents. Several specimens examined at the municipal laboratory were found to present pathological changes characteristic of plague, and moreover pure cultures of plague bacilli were obtained from the enlarged glands and other organs. The following incident came under my own immediate observation. A death from plague occurred on certain premises in British Indian-street. Previously a number of dead rats had, it was ascertained, been found on these and on adjoining premises, and several cases of plague had occurred in the immediate neighbourhood. The patient had died at 3 A.M. on June 15th, and at 7 A.M. I saw the body, which was still lying in the outhouse or *godown* where death had occurred. The post-mortem examination revealed all the pathological changes characteristic of plague, and I was moreover able to obtain pure cultures of the plague bacillus from both the bubo and the liver. There was therefore no doubt as to the cause of death. At the time of inspecting the body I had observed that the big toe of one foot had been half eaten away by rats. During the following week or two there was a marked increase in the number of dead rats found on the premises where the man had died and on the adjoining premises. Some dazed and sickly-looking rats, which showed evident signs of severe illness, were also seen in an adjoining house. Unfortunately these facts did not come to my knowledge until later, and it was therefore impossible to obtain any of the bodies for examination, but the facts left little doubt in my mind that the rats had died from plague, and that in some at least this result was brought about by their fatal feast off the tissues of the dead man's toe.

A few words may be added as to the mortality of the plague as it has shown itself in Calcutta. Among male Hindoos the proportion of reported deaths to reported cases has been 86·2 per cent.; among female Hindoos, 72; among Hindoos of both sexes, 84; among male Mohammedans, 85; among female Mohammedans, 88; among Mohammedans of both sexes, 86; among male Eurasians, 54; among female Eurasians, 73; among Eurasians of both sexes, 63; among males of all classes, 83; among females of all classes, 76; and finally among persons of all classes and both sexes, 82 per cent. The figures upon which these percentages are based are in many instances, particularly in the female groups, too small to permit of any sweeping conclusions as to racial or sexual susceptibility to the plague poison, but attention may be called to the remarkably low mortality among Eurasians. A similar observation was, it will be remembered, made in the epidemic in Hong-Kong. The mortality among the natives, both Hindoo and Mohammedan, as expressed by the above figures, may possibly be above the truth, as cases which recovered are more likely to have been concealed than cases which died. The only European (a male) who contracted the disease recovered. Of other nationalities, two Chinese, one Burmese, and one Jewess caught the disease, and in each case it proved fatal.

Calcutta.

[9] I am assured that this is so by the medical officers of the Medical College Hospital.

[10] Parliamentary paper C. 8386: Papers relating to the Outbreak of Bubonic Plague in India. The statistics are furnished in a statement by Surgeon-Lieutenant-Colonel W. Allan May, in charge of the Station Hospital, Calcutta, dated October 22nd, 1896. It had been suggested that the cases suspected to be plague then occurring in Calcutta (*vide supra*), and some cases of glandular fever in men of the Shropshire Regiment (recently transferred to Calcutta from Hong-Kong where they had been on plague duty) might have some connexion. The statistics here referred to rendered this view untenable.

[11] In the Parliamentary paper already quoted from will be found a reprint from the *British Medical Journal* of an article by Fleet-Surgeon Charles C. Godding on "Non-Venereal Bubo," from which it appears that a bubonic disease with fever is common in the navy on certain stations, a yearly average of 733 cases occurring out of a yearly total of 56,180 men. The disease would, however, appear to differ from the one under consideration in the more frequent occurrence of suppuration. May not the habit of sailors of going about barefooted afford an explanation of the occurrence of these buboes, which are "invariably inguinal"?

[12] Dr. Cantlie and Dr. Lowson at the Epidemiological Society of London in December, 1896. THE LANCET, Jan. 2nd and 9th, 1897.

[13] A. B. was attacked with plague on June 30th, 1898. He recalled the fact that two or three weeks before (he could not fix the day) his little dog had brought a dead rat and placed it on his bed. A day or two later the dog had seemed unwell, but it had rapidly recovered; it was not known whether any glandular enlargement had occurred. The patient had touched the rat in removing it from the bed; but in view of the facts that over a fortnight elapsed before he himself sickened, and that he lived in an infected area, there seems no reason to believe that this was the particular source from which he contracted the infection.

NOTE ON A CASE OF SATURNINE AMBLYOPIA.

BY CHARLES BELL TAYLOR, M.D., F.R.C.S. EDIN.,
SURGEON TO THE NOTTINGHAM AND MIDLAND EYE INFIRMARY.

A WOMAN, aged twenty years, single, consulted me on account of failing sight in May of the present year. There was no evidence on superficial examination of inflammatory affection or organic change, but the ophthalmoscope revealed white atrophy of the left optic disc and I found on testing vision marked central scotoma in both eyes, notwithstanding that the right papilla was apparently normal (amblyopia

without tissue change). I diagnosed drug amaurosis and detected in the urine traces of lead which I then ascertained she had been taking in ten-grain doses nightly in the form of emplastrum plumbi for upwards of three weeks. Under treatment the right eye recovered perfectly, but the left, although it has improved considerably, is still very defective and likely to remain so.

The power of certain drugs to produce definite tissue change in the optic nerves (axial neuritis) is a curious property possessed by a variety of substances—alcohol, tobacco, lead, and other metals for instance, as well as quinine, salicylic acid, santonin, bisulphide of carbon, and various coal-tar products. Of these, according to my experience tobacco is the most frequent cause of impaired sight, not only on account of the nicotine which it contains and which in its natural form blinds the horses which graze upon pastures where tobacco is grown, as in some parts of New South Wales, but also on account of the pyridine, viridine, carbolic acid, and marsh gas which are set free when it is smoked. Alcohol probably comes next, while saturnine amblyopia among the workers in lead factories has been known for centuries. The lead may enter the system either with articles of food or drink, the workmen in the former case neglecting to wash their hands, or through the skin by means of hair dyes and cosmetics, or by silk threads which are weighted with sugar of lead and bitten instead of cut by those who use them. In my case the patient, finding herself pregnant, took diachylon in order to procure abortion, with no other effect than to cause blindness in one eye. That this should result in four weeks' time without other symptoms of plumbism, colic, leadline on the gums, palsy, or wrist-drop is indeed singular if not unprecedented.

With regard to treatment in such cases iodide of potassium should be given in large doses, the patient should use baths of sulphuret of potassium, take sulphate of magnesia, mercury, and pilocarpine, while the affected nerve should be galvanised with the continuous current, about 2 milliampères to each temple daily.

Nottingham.

STRANGE SUCCESSION OF FRACTURES IN A COLLIER, WITH REMARKABLE COINCIDENCE IN TIME OF OCCURRENCE.

BY D. T. RICHARDS, M.D. GLASG.,
SURGEON TO RISCA COLLIERIES.

AS might naturally be expected from his hazardous occupation the collier is frequently injured by accidents underground. But the following particulars deserve, I think, a space in THE LANCET because of the strange series of fractures sustained by the man himself and his near relatives, as well as the remarkable coincidence in the date of their occurrence as far as the patient himself is concerned.

A man, aged forty-four years, short and well built, was first attended by me on August 26th, 1890, for a compound fracture of the left leg, resulting from a portion of the roof or top falling and striking him while following his employment in Risca Collieries. After being brought out and conveyed on a stretcher to his home on the hill-top, a distance of about three miles, a journey by no means easy to bear by a man with a fractured leg, I found on examination a crescentic wound nearly 3 in. long on the outer aspect of the middle of the left leg, and well peppered over with coal-dust. In spite of the temporary splints and scarf tourniquet applied by his fellow workmen considerable hæmorrhage had occurred, no doubt aggravated by the long, rough journey over an uneven road and up the hill. An anæsthetic was given and the tibia and fibula were found to be fractured near the same level, about half-way between the knee and ankle, and detachable sequestra were removed. After free ablution and cleansing with carbolised water and the limb being brought to a good position iodoform gauze was applied and the leg put up in a modified box-splint. For some hours, the patient felt easy, but during the night he was sick and the leg was painful, which kept him from sleeping. When seen next morning his temperature was 102° F., the pulse was 112, and the tongue was covered with dry white fur. After a grain each of calomel and opium he felt easier and slept. Suffice it to say the patient made an uninterrupted recovery and was able in about six months to resume his work as a collier underground.

The patient's previous history, told by himself and corroborated by others, is very remarkable. With the exception of an attack of typhoid fever, which he had when eighteen years of age, and two or three attacks of quinsy subsequently, he had not suffered bodily in any way. He was always very temperate and for about eighteen years a total abstainer. But his misfortunes in the mine were many and are remarkable from the fact that they all happened on the 26th day of August. Here is his record. At the age of ten years he fractured his right index finger. It happened on August 26th. When thirteen years old he fractured his left leg below the knee through falling from horseback, also on August 26th. When fourteen years of age he fractured both bones of the left forearm by stumbling, his arm striking the edge of a brick (August 26th). In another year, on August 26th, when fifteen years of age, he had compound fracture of the left leg above the ankle by his foot being caught under an iron rod and his body falling forwards. Next year, again on the same date, August 26th, he had compound fracture of both legs, the right being so severely crushed that it had to be amputated at the lower third of the thigh. This was caused by a horse, hitched to a tram of coal, which, running wild underground, caught him in a narrow passage, crushing both legs severely. After this he did not work on August 26th for 28 years, and little wonder, but in the year 1890 he forgot his fateful day and went to work, with the result that he sustained the compound fracture which I have mentioned in the beginning. After this he has studiously avoided working on August 26th, though never missing work at other times.

The patient's father is living, aged seventy-nine years, and has never had a severe injury. His mother died at the age of seventy-nine years. When aged sixty years she had compound fracture of the leg below the knee through being run over by a truck. Recovering, she enjoyed good health for fourteen years, when the old wound reopened and discharged small pieces of bone. The wound remained open for about a year, when under treatment it healed. From this time her health failed and her death, which occurred soon after, was attributed to the healing of the wound. The patient had no brothers, but his only sister, when ten years of age, fractured both bones of the forearm, refracturing the same in about three weeks by falling with her arm under her. One cousin had an arm amputated at the shoulder for injury and another cousin had a severe compound fracture of the leg, while a third had fracture of the leg from which he died. Of three paternal uncles one had his leg amputated for injury underground.

Risca, Mon.

SARCOMATOUS DEGENERATION IN AN UNDESCENDED TESTICLE; CASTRATION; RECOVERY.

BY JAMES R. WALLACE, M.D. BRUX., F.R.C.S. IREL.,
FORMERLY RESIDENT SURGEON TO THE MEDICAL COLLEGE HOSPITAL, CALCUTTA.

AN Anglo-Indian, aged twenty-five years, short, thick-set, and of good constitution, was born a cryptorchid, his left testicle having remained undescended from birth. There was always, as long as the patient could remember, a "lump" in the left groin. It had remained absolutely painless till about four months previously to his consultation with me, when he observed occasional acute pains in the swelling and a frequent sense of nausea. In a few weeks the pain became worse, the swelling more enlarged, and there was persistent vomiting, which confined him to his bed for a few days. The symptoms subsided, but with the resumption of his duties there was a recurrence of suffering. When I first saw him, on March 22nd, 1898, the lump in the groin was hard, tender, and non-fluctuant. The slightest pressure upon it induced nausea. Sulphate of magnesia with tartar emetic in small doses internally, the application of belladonna and glycerine to the swelling, with rest in the bed, gave complete relief

and for three weeks the patient was able to go about his work. On April 25th he had a recurrence of all the bad symptoms above described, but finding that the slightest exertion was attended with a return of suffering he was advised to undergo castration of the undescended testicle. Accordingly on April 29th he was placed under chloroform by Dr. William Coulter. I cut down upon the testicle, doing the bulk of the dissection with the handle of my scalpel. The main vessels leading to the tumour were ligated and the mass was cut off above the ligature. All bleeding points were quickly secured by pressure forceps so that the patient did not lose more than half an ounce of blood during the operation. The wound cavity was insufflated with iodoform and boric acid, a drainage-tube was inserted, and the incision was closed by horsehair sutures. Boric gauze dressings were applied and changed on the second day, when also the tube was removed. The subsequent progress was most satisfactory. During the operation I had the assistance of Mr. Arnold Caddy.

Remarks.—This case is interesting from the diagnostic value of the reflex testicular vomiting as the characteristic sign of the disease present. On cutting into the testicle after removal it was found to have undergone purulent inflammatory change, and as the structure of the mass seemed very much altered pathologically it was sent to Surgeon-Major J. F. Evans, the pathologist to the Calcutta Medical College, who reported on it as follows: "I find the tumour which you sent me on April 29th to be a round-celled sarcoma, with practically no trace remaining of the glandular structure of the organ in which the new growth arose. There is some evidence of inflammatory change and of hydrocele having occurred prior to the formation of the growth."

Calcutta.

RE-BREATHED AIR AS A POISON *PER SE*.

BY JOHN HARTLEY, F.R.C.S. ENG.,

SURGEON TO THE DARLINGTON HOSPITAL; LATE SENIOR DEMONSTRATOR OF ANATOMY, MIDDLESEX HOSPITAL MEDICAL SCHOOL.

THE noble work which has been, and is still to be, done by the bacteriologist can never be over-valued or over-applauded, but I think our attention is apt to be so absorbingly fixed on the ever-increasing cloud of organisms that we are somewhat in danger of losing sight of the effects of those gaseous poisons which are so prone to accumulate very literally under our noses in the present state of "civilisation" and over-crowding. The "Fresh Air Treatment of Consumption," which has been so lately hall-marked in a manner absolutely unprecedented, appears to be made up of three essential factors: (1) the discontinuance of the supply of bacilli from without; (2) the supply of an abundance of nutritive material to the tissues; and (3) the supply of an abundance of fresh air uncontaminated by the products of respiration. This seems to mean that the tissues if not too enfeebled may be trusted to deal with the bacilli already present if their metabolism is kept going at high pressure. Fresh air is now the "official" remedy in the treatment of tubercle. Why is it so ignored in the case of other diseases? We are told that the expired air of the phthisical patient contains no bacilli, so that apparently re-breathed air is not forbidden to him on account of these. Does the pneumonic or bronchitic breathe out bacilli? If so he would seem to require airing more than the phthisical patient; and if he does not, what then? A rise of temperature or the presence of bronchitis or of a patch of pneumonia in the phthisical patient is, I am told, no bar to his being officially aired. Has the pneumonic or bronchitic no need of special ventilation because his microbe is of a different breed?

Within the last three years or so I have known a severe case of double pneumonia (probably influenzal) treated by a specialist, without protest, in an unventilated little room with closed door and window and no chimney but with a paraffin lamp burning day and night to keep up the temperature. When I remember this and contrast the treatment of pneumonia by one eminent authority with the treatment officially recommended for phthisis by the other eminent authorities with the weight of the Colleges at their back, am I, a poor, unscientific, general practitioner, to be blamed if I find it, like Dickens's millband, "awe a muddle"? And it is with the greatest humility that I venture to suggest it is possible when the air was created that it was intended not only for phthisical patients or patients suffering from pneumonia but for *all*—diseased and healthy alike—and that it is still the natural medium in which the poisonous products of tissue metabolism excreted by the lungs are further broken down and rendered harmless. With even more humility I suggest that it is a work of supererogation to heat air twice over—since everyone has, I suppose, a fairly good heating apparatus inside; that, in fact, so long as the patient's surface is kept warm it is of no consequence whatever whether the air he breathes, provided it be fresh, is at freezing point or the traditional 65°.

Dr. A. Ransome has done great service not only by his onslaught on "air sewage" but also by his coinage of the term. For a thoroughly good opprobrious epithet resembles a good wall-poster in its power of arresting and enchaining the attention of the many. It was long ago pointed out that certain constituents of expired air are intensely powerful nerve poisons. Whether sewer gas has been actually proved to contain similar toxins I am sorry to say I do not know, but having regard to its largely similar origin from decomposing proteid, though coming through a different channel, one can hardly doubt that it is so. These considerations should surely make us look on re-breathed air and sewer gas, not as mere carriers of accidental poisons, such as influenza and pneumonia and the like, but as *poisons per se*, and I wish to be allowed to record a few very imperfect observations made by myself during some years past chiefly on the subject of re-breathed air, with certain inferences which I think tend, however feebly and imperfectly, to show that the poisons we expire have *per se* very definite effects on tissue metabolism and need not a mere perfunctory admixture with fresh air but very large and very continuous dilution before they are rendered innocuous—that is to say, innocuous to *all;* for while some persons appear to be almost immune others seem intensely susceptible.

The first observation I will allude to was made in the autumn of 1896, in cool weather. I had to take a long night journey by rail after a long and hard day's work. The train was full and the compartment I entered was close, so, as I was tired and fagged, I sat in the corridor by an open window, well rugged up, throughout the journey. The compartment was completely shut off from the corridor by a glass door and windows, through which I could freely inspect its occupants. Two remarkably fresh-complexioned, wholesome-looking young fellows got into the compartment at York. They formed a remarkable contrast to the pallid and fagged-looking travellers already there. The windows and ventilators were carefully closed, and the new-comers, with the rest, settled off to sleep and slept soundly for nearly four hours, with the exception of a few minutes' interval at Grantham. When aroused on nearing London they, like the other occupants of the compartment, were haggard and leaden-hued, their fresh colour was entirely gone, and they looked and moved as if exhausted. I examined my own face in the lavatory mirror at the beginning and end of the journey and could see but little alteration in my colour, if anything it was rather improved by the end of the journey, and though I had slept little I was decidedly less tired than when I started. There had been but little smoking in the compartment, every one had slept too soundly. The gas lamp, I noticed, was so fitted that the products of combustion escaped directly into the outer air; the hot-air apparatus had not been started. It seemed to me that the change in the appearance of the two young fellows must be due entirely to the effects of re-breathed air. The inferences seemed to be these: the leaden grey hue was a mixture of pallor and blueness, pallor owing to contracted arterioles, blueness due to dilated venules, whether from peripheral vaso-motor changes primarily or from central changes beginning in the heart or lungs I cannot say, but I am inclined to believe peripheral, or why do so many people get clammy feet and hands in a close room? Carbonic acid may have had something to do with it—I think not much. The colour was more pale than blue—i.e., grey; and a similar though less marked change may be seen in the faces of some of the members of most congregations any Sunday towards the end of the service even though the air space is large enough to put carbonic acid poisoning out of court.

Dr. Lauder Brunton a good many years ago recorded a

most interesting experiment designed to show the antagonistic effects of muscarin and atropin. The thorax of a curarised dog was opened and artificial respiration started; a small quantity of muscarin was then injected with the result that the right heart and lungs became greatly swollen and engorged while the left side of the heart became almost empty. Atropin quickly caused both sides to return to their usual size and the lungs returned to their usual colour. I believe no mention was made of the state of the peripheral circulation; but I have often thought that re-breathed air must contain a poison similar in its effects on the peripheral circulation to those recorded by Dr. Brunton of muscarin on the central.

Some years ago a patient of mine, who certainly had all the surroundings which can render a man liable to sewer-gas poisoning, was seized with acute illness. He lay on his back with limbs outspread, a leaden-coloured face and clammy skin, with sighing respirations, a small, quick, feeble pulse, great restlessnes, and complaining of "awful" flatulence, begging me to relieve the "awful" distension of his abdomen. (These were his expressions.) There was *no* distension and *no* tympanites. His symptoms were slowly relieved by large doses of atropin subcutaneously and next day he was better, his colour was natural, and the sense of distension was gone, but his abdomen was very tympanitic. I thought the sense of distension complained of was due to overfulness of the abdominal veins, not to distension of gut—that he was, in fact, bleeding almost to death into his abdominal veins. When somewhat better he went to Norway and kept well there except for two slight attacks. The first occurred at a primitive inn where the contents of a cesspool in the closed courtyard were carried through the house in buckets on the night before the onset of his illness; the second attack, a very slight one, occurred on a return visit to the same inn. This is probably an unjustifiable digression, but the effects of sewer-gas on myself are, so far as sensations go, almost identical with those of re-breathed air.

The second case occurred early in 1897. I was asked to see a woman, aged about forty-eight years, who had been treated in a neighbouring town for many weeks for bronchitis and asthma following influenza. She had relapsed about a week when I first saw her. She was then sitting up in bed; her face was leaden-coloured, her skin was clammy and sweating, with a feeble, quick pulse, and the heart sounds were indistinguishable owing to wheezing; there was some crepitation at the bases. The temperature was about 101° F. The weather was cold, but after wrapping her up, with a hot bottle to her feet, the window was well opened. Her colour improved in a few minutes and the sweating ceased soon after. But it and the blueness returned if the window was shut for any time. It was directed to be kept open night and day, and I could see from my house that this order was carried out. Although on one night the thermometer showed 14° F. of frost the chest was clear of noises and she was convalescent in eight days. If fresh air needs warming she ought to have died.

The next case was that of a slight but healthy-looking young fellow, aged twenty-two years, who was admitted into the Darlington Hospital under my care in September, 1897, suffering from a strangulated congenital hernia. An operation for radical cure was performed in the usual way. The hospital was then full, and the ward in which the patient lay was in my opinion decidedly stuffy, though in other respects its sanitation was excellent. The wound gave no trouble, but the patient became very restless, with grey face, foul tongue, and irregular temperature. Within forty-eight hours retention of urine came on, necessitating the use of the catheter several times a day. Five days after operation, the patient's condition remaining unimproved, he was removed to an empty room with wide open windows. Within twenty-four hours the temperature had become normal and it remained so, and the catheter was required only once, a few hours after his removal. The wound healed without trouble and he remained in this room a fortnight, looking, eating, and sleeping well. He was then moved into the general ward, which was certainly in as good a sanitary condition as those of any London hospital. Within twenty-four hours he became restless and grey, his temperature rose, and he again required the catheter regularly. The need for this again ceased immediately on his removal back to the old room with the open windows; and though he went through a slight attack of influenza, which was then rife in the town and hospital, the old symptoms soon vanished and did not recur; but we kept him in the airy room till his discharge.

If, as I believe will be found to be the case, the poison of re-breathed air tends to cause contraction of arterioles and dilatation of venules, it is easy to understand how diminished arterial supply and sluggish venous outflow must hamper metabolism and render tissue change slow and imperfect. This alone seems to me to be a strong reason for giving operation cases all the fresh air obtainable. The greatest care must of course be taken to keep the surface and extremities warm. The common occurrence of faintness (usually ascribed to "the heat") in crowded buildings or even in crowded streets would seem to show the probability that expired air contains a poison having a powerful effect on the cardio-inhibitory function of the vagus.

And what about exhaustion? Why do most men feel so tired after an afternoon's work in a crowded out-patient room. Why is a long journey in a full railway carriage, even with a comfortable seat, so exhausting to many people? Personally an hour or two in a full carriage with the windows shut will give me numbness in my feet and legs and knock me up for the day, while a railway journey in an empty carriage with open windows does not affect me at all. But most people will be willing to admit that any kind of crowd is tiring. And it is to me difficult to resist the impression that an overdose of waste products, whether of one's own or other people's, must generally interfere with the metabolism of nerve tissue. Can constant exposure to re-breathed air (or sewer gas) be one of the causes of the unexplained neuroses and non-specific nerve degenerations? I feel convinced that infants kept in close rooms are peculiarly liable to convulsions, and I believe that many cases of neuralgia are due to this cause. Paralysis agitans strikes me as being another possible example.

Besides all this I am inclined to believe that one of the essential causes of "idiopathic" anæmia will be found among the volatile products of tissue metabolism, and that expired air, and probably sewer gas also, contains something which when inspired either hinders the evolution of the red corpuscle or breaks up its hæmoglobin. Why are the majority of the members of the nursing and resident staffs of the London hospitals anæmic? As a rule they are not ill-fed or greatly over-worked. The hospitals are well lighted and well warmed, foul wounds are things of the past, sanitation is excellent, except in one particular, and it is this—with so many persons under one roof and with the ordinary means of ventilation at present in vogue it is manifestly impossible to get rid of the products of respiration so rapidly and continuously as to prevent their being re-inspired. Why do hospital patients, adults and children alike, improve so rapidly in colour and vitality when able in the summer to lie all day in the garden? What other condition is common to so many pale people of all classes? Take for instance the city clerk, the Lancashire millhand, the overfed footman, the underfed lodging-house drudge, the coffee-house waitress, the wealthy old lady with a terror of "draughts,"—all these and many and many another live almost entirely in re-breathed air. The pallor of the drudge or the waitress is certainly not due to a sedentary occupation. The fact that indoor occupations are far commoner amongst girls than youths is perhaps suggestive, so far as it goes, as partly accounting for the greater frequency of anæmia in the former. What the hæmoglobin-destroying poison may be, should it ever be proved to exist, whether one or more of the innumerable sulphur compounds, I will not attempt to guess. Why some persons seem immune, why some of those affected become deeply and variously pigmented and others slightly or not at all is to me inexplicable.

Women as they grow older are apt to live much indoors. I believe the fat, flabby, paunchy woman, whether purple or pale, with feeble, irritable heart and "inadequate" kidneys, is usually the victim of re-breathed air. I think it will turn out that many feeble hearts and inadequate kidneys, without any definite history of antecedent acute disease, may at least in part own this cause. It seems as if both anabolism and katabolism had been hindered, and inert fat formed and stored, at the expense of active protoplasm. Is it possible that unexplained and fatal "suffocative breast-pang" may be due to a muscarin-like action of this poison on a degenerate heart?

Quite lately I have had as a patient a clerk in the service of a railway company, who works in a very close office immediately under the roof of a large station. He suffers much from flatulence and constipation during the week, but he assures me he has no trouble from either when he visits his parents' home in the country for the week end. A "close" room will infallibly give me abdominal distension

and borborygmi within half an hour and I am inclined to think the purity of the air breathed by the dyspeptic quite as important as his regimen or his teeth. It must, I think, sooner or later be recognised that many of the increasing ills which it has been the fashion to charge on the "hurry and brain fag" incidental to a high state of civilisation and a large population are in reality due to the greater contamination of the air we breathe by the waste products of that population, and that toxins excreted by the lungs will in time take high rank among these as both potent and insidious. If this should come to pass the present ideas anent ventilation must be abandoned as utterly futile, and the need will be felt, not of letting a little air in, but of rushing waste products out, a vastly different matter, for which the Tobin's tube and tiny so-called ventilator are hopelessly inadequate. Our methods of ventilation generally must be more approximated to those now approved by the Colleges for the airing of the phthisical patient; and, above all things, we must sleep in a "thorough draught" of pure air. The "surface ventilator" for sewers—that cheap and effective fouler of our street air—must surely also go.

It would seem that any departure from health is more and more to be recognised as due to some definite cause—mostly to some definite poison—which poison (or its producer) has most commonly been introduced from without; in fact, with some very obvious qualification and reservation, a paraphrase of the first law of motion might almost stand as a first law of medicine—viz., the body in health will continue in health unless acted on by some external poison. Whether or no any fresh grain of truth may have been turned up by my ignorant groping, of this I am certain, that the subject of re-breathed air in its relation to disease affords a grand field for skilled and accurate scientific research.

Darlington.

A CASE OF LARGE CYSTIC ABDOMINAL TUMOUR PROBABLY OF THE BROAD LIGAMENT OR OVARY OF UNUSUAL DURATION AND SLOW GROWTH.

BY J. H. DAUBER, M.A., M.B., B.CH. OXON., M.R.C.P. LOND.,

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I AM not acquainted with any recorded case of ovarian or broad ligament cyst of large size with a history of over fifty years' duration, and as the following case appears to me to be authentic and genuine it may be of some interest to place it on record.

I saw the patient on two separate occasions in my out-patient department at the Hospital for Women, Soho, with an interval of several months between them—the second time being in February, 1897. On both occasions careful notes of her statements were taken and she was subjected to a somewhat severe cross-examination. She was frank, candid, and intelligent, and made no statements of a contradictory and inconsistent character. She gave her age as seventy years, and was a thin, small, and shrunken woman. Her leanness was less noticeable when she was dressed, because of the distension of the abdomen; moreover, she wore a large amount of padding over the chest, as she explained, "to correspond with her stomach." Upon examination the abdomen was seen to be completely occupied by a large tumour extending from the pubes to the ensiform cartilage and bulging on either side as she lay on her back beyond her body. The tumour was not very tense; it was uniformly dull on percussion; the flanks were resonant and the area of dulness was not altered by change of position. Fluctuation was easily obtainable wherever the dulness extended. The girth at the umbilicus was 43 in. *Per vaginam*, senile atrophic changes were well marked. The uterus was small, low, and moveable.

The history she gave was that as a girl as far back as she could remember she was always "high-stomached," but that at fourteen or fifteen years of age this became so noticeable that people commented upon it, so much so, indeed, that her father—her mother being confined to bed at the time—took her with him to consult Mr. Cumplin of Charterhouse-street, who after examining the abdomen called her father aside and informed him that he considered she was pregnant. Her father was doubtful and said: "Well, be that as it may, she shall not leave my roof till it is over." The tumour continued to increase if at all very slowly, and at the end of about ten months her father took her to see Mr. Cumplin again, who then admitted he had been in error and advised the patient to consult Dr. Frederick Bird of Brook-street. Her mother took her to him and the patient was very positive that she was not more than fifteen years of age—certainly not more than sixteen—at the time of this visit. Dr. Bird pronounced the swelling to be due to an ovarian tumour. He seems to have taken much interest in the case and the patient speaks most gratefully of his kindness throughout a long series of years. She invariably declined all operative measures, even tapping, when suggested to her, though from time to time Dr. Bird and Sir Spencer Wells, who saw her with him on more than one occasion, pressed her to undergo operation. For a time she was in Dr. Bird's private hospital in Carey-street, Lincoln's Inn, which, according to the patient's statement, he carried on with five other medical men "each having one bed and paying the cost of it."

The patient was twice married, first in 1843, when she says she was nineteen or twenty years of age—but either age would make her over seventy years old now. Her first husband died when she was six months pregnant with her first child, about two years after marriage. She was married again in 1849, and this time to Dr. Bird's coachman, and so remained under Dr. Bird's observation for many years. She had four children, one—which was posthumous—by her first husband; three by her second. The first child was a boy; it was a "crossbirth" and stillborn. Dr. Jameson of Finsbury-pavement attended her. The second child (a girl) was born in 1850; this was also a "crossbirth" and stillborn. A "gentleman from South Audley-street," whose name she cannot recall, attended her with this child. At the third confinement Dr. Bird and Dr. Merriman of Grosvenor-street were present and they succeeded in delivering her of a live child (a girl) who lived to the age of thirty-two years. Dr. Bird, with his friend Dr. Morgan, again assisted her at the birth of the fourth child (a boy) who survived to his fourth year. All the labours were very difficult.

I think from these detailed statements, which to me bear the impress of veracity, there can be but little doubt that her present large tumour was also of considerable size at the age of fifteen years, that it subsequently complicated all her confinements and that it excited much interest in the minds of Dr. Bird, Sir Spencer Wells and some other gynæcologists at a time when ovariotomy had not become an established operation, but when the treatment by tapping was gradually being abandoned in favour of the radical cure. I may add that the patient declines all operative treatment at the present time as persistently as she has done all her life.

Charles-street, Berkeley-square, W.

A CASE OF LAPARO-NEPHRECTOMY IN AN INFANT SIXTEEN MONTHS OLD.

BY J. A. CAMPBELL KYNOCH, M.B., C.M. EDIN.

THE question of operative treatment in cases of malignant tumours of the kidney in young children is one on which there is still difference of opinion. The operation has not received much favour in this country. Thus Bland Sutton states that nephrectomy in such cases is absolutely unavailing (1) on account of the frequent immediate fatal results and (2) the almost certain early recurrence of the disease in those cases that recover from the operation. He tabulates 21 cases of operation for renal sarcoma in children under six years of age with the following results: 12 died from the operation, and of the 9 that recovered all died from recurrence within one year. The late Mr. Greig Smith held that the operation was only justifiable (1) if the tumour was small; (2) if the general condition of the patient was satisfactory; and (3) if the patient was at least four years of age. Keith states that in young children it is doubtful whether it is ever right to operate. In Germany the operation is much more frequently undertaken, except in those cases in which

the disease is obviously far advanced. The results, however, are not very encouraging. Thus, of 150 cases (including all ages) collected by Czerny only five lived more than five years after operation, and of his own 12 successful cases only one patient was alive at the end of that period. Aldibert, finding from a collection of 45 nephrectomies in infants an operative mortality of 48 per cent. and an ultimate one (within a short period) of 75 per cent., considers that this operation should not be undertaken except in the very early stages, and Chevalier concludes that operative treatment in such cases is quite unwarrantable. The most recent complete monograph on the subject of sarcoma of the kidney in children is that of Walker of Baltimore, who has collected from all sources 145 cases, 3 of which came under his own observation. Of these 74 were operated upon with the following results: died from the operation, 27; recovered from the operation but had early recurrence, 28; recovered with incomplete subsequent history, 15; cured, 4. Of those included as "cured" each case was reported on at least three years after operation. Walker finds the average duration of life without operation in such cases to be 8·08 months and that with operation 16·77 months, and concludes that although the percentage of cures is only 5·47 per cent., still, in consideration of the invariably fatal termination, operation is justifiable in all early cases and an exploratory incision in all except the very large tumours and advanced cases. In this country cases are recorded which have been operated on with satisfactory results by Mayo Robson and J. D. Malcolm.

The following case is of interest on account of (1) the early stage at which the condition was recognised and thus making it a favourable case for operative treatment, and (2) the age of the child. The case of the youngest infant successfully operated on is recorded by Schmidt of Munich. His patient was six months old and remained well three years after operation. There are about six cases reported where the operation of nephrectomy was performed with satisfactory results in infants under two years of age. Thus Abbe records a case operated on at the age of fourteen months, the patient remaining well four years afterwards.

In August, 1896, a female infant, fourteen months old, was brought to me on account of diarrhœa of some weeks' duration. This was relieved by ordinary means. The family history was good; the child was very weak and emaciated in appearance. On palpating the abdomen there was found a tumour the size of a lemon in the right lumbar region; it was slightly irregular in outline, fairly moveable, solid in consistence, and apparently not tender to pressure. The ascending colon could be made out in front and to the inner side of the swelling; the liver was separated from its upper margin by a resonant area, the spleen was not enlarged, and the left kidney was not palpable. The external genitals were normal. There was no glandular enlargement made out. The heart and lungs were normal. The urine was of specific gravity 1015, amber and contained no albumin, blood corpuscles, or epithelial cells. There had never been hæmaturia. As I had evidently to do with a renal tumour, and as the case appeared to be a very suitable one for operative treatment, I decided upon an operation if the emaciated condition of the child could be improved. In the course of two months there was not the very rapid increase in the size of the swelling which might have been expected, and as the child's condition was if anything more favourable for operation I decided to carry it out, Dr. Foggie giving chloroform and the nurse assisting me. A vertical incision was made over the tumour slightly inside the anterior superior iliac spine, my intention at first being to remove the tumour extra-peritoneally. This I found would cause delay and difficulty in reaching the pedicle. The peritoneum was opened, the opposite kidney was made out, the incision enlarged, the posterior layer of peritoneum opened, and the tumour with its capsule easily detached. The renal vessels were ligatured together with silk, then the ureter separately, and both were returned into the abdomen. There was very little hæmorrhage and, satisfying myself that oozing had ceased, the wound was completely closed with interrupted silkworm gut sutures and dressed with iodoform and boric powder. The child stood the operation, which lasted twenty minutes, well. On the following day the temperature was 102° F. and the pulse was 140 and on the fifth day the temperature was 103°, when a stitch abscess was discovered. Two sutures were removed, when the temperature came down to 99°. The stitches were all removed on the tenth day and the subsequent history was one of steady recovery.

On examining the kidney the tumour, brain-like in appearance, occupied the greater part of the organ, the kidney itself being represented by a band extending over the front of the tumour and seperated from the latter by a capsule. A piece of the tumour was examined by the Clinical Research Association. The following is the report: "The tumour is clearly of the adenomatous type—that is, tubules embedded in a loose and delicate cellular tissue. In places the stroma contains many round and oval nuclei and here the tubular arrangement of the neoplasm is not distinct; the appearance is that of solid cords of epithelial cells. The present specimen would be called by some an adeno-sarcoma, but there is not sufficient evidence from the piece of tissue examined to pronounce it malignant as it would be desirable to examine further sections and search for striped muscle cells and sarcoma tissues."

The child has now been under observation for nearly two years and appears to be in perfect health as compared with its appearance before the operation. The result, I think, justified the line of treatment adopted, even should recurrence yet take place.

Dundee.

TWO CASES OF

ACUTE DIFFUSE CELLULITIS OF THE SUB-MAXILLARY REGION (ANGINA LUDOVICI) IN WHICH TRACHEOTOMY WAS PERFORMED; RECOVERY IN ONE.

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FOR permission to publish the reports of these cases I am indebted as to the first to Mr. W. H. A. Jacobson, senior assistant surgeon to Guy's Hospital, to whom at the time I was acting as house surgeon, and as to the second to Mr. Connell Whipple, senior surgeon to the South Devon and East Cornwall Hospital.

CASE 1.—A woman, aged forty-three years, was admitted to Guy's Hospital at 8·30 P.M. on Feb. 27th, 1892, under the care of Mr. Jacobson, suffering from an inflammatory swelling of the neck with dyspnœa. The history obtained was that three days previously she had fallen against the sharp edge of a chair and had bruised or cut her chin. The wound became inflamed and the redness and swelling increased rapidly up to the time of her admission. The whole of the tissues between the chin and the sternum and between the sterno-mastoid muscles of each side were then in a condition of brawny, inflammatory œdema, and the patient was dyspnœic and of bad colour. She was taken into the ward used for "septic" cases and shortly afterwards, in response to an urgent summons, I found her sitting up in bed moribund from asphyxia. She was at once laid back and an incision was made deeply from chin to sternum in the middle line through the inflamed tissues. These yielded nothing but dark blood and serum and the incision was rapidly deepened until the trachea was found at about 5 in. from the skin surface and slightly to the left of the middle line. It was opened and a sinus-forceps inserted, while the bleeding from the cut surfaces was stopped by the application of pressure forceps (some of which were left *in situ*) and sponges wrung out of boiling water. As no tracheotomy tube was sufficiently long to reach the tracheal opening a Symonds' œsophageal tube was inserted and the cavity round this was powdered with iodoform and tightly packed with strips of sal alembroth gauze, to avert, if possible, the entrance of septic material into the trachea. A hot boric fomentation was placed round the neck over all and changed every two hours. The patient was ordered to take 1 oz. of the mistura spiritus vini gallici every four hours and she was directed to breathe near a steam kettle. On the 28th she was better. Her pulse was 130. The sal alembroth strips were changed and the Spencer Wells's forceps were removed. The next day her temperature was 102° F. and the respirations were 20. The A. C. E. mixture was given, and about a dozen free incisions were

made into the still much inflamed neck. These openings were dilated with a steel director and dressing-forceps, and drainage-tubes were placed in two of them. Hot boric fomentations were continued as before and the trachea and the large wound were treated in the same manner. On March 1st her temperature was 101·4°, and the swelling of the neck had subsided considerably the discharge from all the wounds was now purulent in character and quite sweet smelling. The Symonds' tube was removed from the trachea and the whole wound was packed with gauze strips in a square of butter-muslin. Respiration was easy and quiet. She was now ordered a mixture containing 2 grains of quinine every four hours and a pint of champagne and 4 oz. of brandy in the twenty-four hours. The hot boric fomentations were continued. On the 2nd the patient's temperature was 98·4° and the discharge from the wound was sweet. The sal alembroth strips were changed three times in the twenty-four hours. The neck was much smaller in size and the tissues were soft. The tracheotomy wound was beginning to close and there were no adventitious respiratory sounds. The after history of the case was uneventful and she left the hospital early in April.

CASE 2.—A woman, aged twenty years, was seen with Dr. Hay of Plymouth on May 29th, 1898. The history was that three days previously she had consulted Dr. Hay for a swelling in the right submaxillary region. This corresponded to a carious tooth and Dr. Hay advised its removal by a dentist. The patient was not seen again until the morning of the 29th, when her neck had become much swollen on the right side, the swelling extending to the middle line, and her general condition was much worse. The tooth had not been removed. Dr. Hay made a median incision below the chin and ordered the application of hot linseed poultices and prescribed a mixture containing tincture of perchloride of iron every four hours. In the evening, as her condition was becoming serious, I saw her with Dr. Hay about 10 P.M. She was then sitting up in bed. She was of a dusky purplish colour, her pulse was 120, and her temperature was 102° F. There was a brawny inflammatory swelling extending from the lobule of the right ear to the hyoid bone and upwards to the chin and lower jaw. The floor of the mouth was involved and the tongue was of a purplish colour and pushed up against the roof of the mouth. There was much dyspnœa and speech was impossible. Chloroform was cautiously given and I first deepened the incision below the chin opening up the subfascial tissues after Hilton's method. Another curved incision was then made in the right submaxillary region and the deep parts were opened up in a similar manner. From both the wounds dark blood and a little dark-coloured pus exuded. An attempt was then made to extract the carious tooth but it caused such dyspnœa that it was abandoned. The hot poultices were reapplied. On the 30th the patient was somewhat better. The pulse was 110 and the temperature was 101°. The swelling had gone down a little and she could swallow liquids. On the 31st she had a change for the worse. She was more cyanosed and dyspnœic and the left submaxillary region was swelling. As her surroundings were of a poor description and nursing was practically *nil* I advised her removal to the South Devon and East Cornwall Hospital. This was delayed until the following morning, June 1st, when she was admitted at 11 A.M., I saw her at midday and unexpectedly found her better. Her tongue was of a red colour and she was able to protrude it from the mouth. She could articulate and could swallow beef-tea fairly easily. The incisions on the right side were beginning to granulate but there was still much swelling on both sides of the neck. It was decided not to interfere further for the present and hot boric fomentations were ordered to be applied every hour. About 7 P.M. she became suddenly attacked with dyspnœa. A little chloroform was given and I incised the left side of the neck, only dark blood flowing from the wound. Directly this was done respiration ceased. A long incision was immediately made in the middle line and was rapidly deepened, but the trachea could not be found, and after a search with the finger it was felt on the left side of the neck at the depth of the forefinger from the skin and some 2 in. from the middle line. The knife was pushed along the finger and the trachea was opened and kept open with sinus forceps, and artificial respiration was performed, but the patient failed to recover.

The symptoms in the latter case were somewhat fluctuating, but I regret that I did not perform tracheotomy earlier, before the trachea, pushed across by the swelling on the right side, had become compressed by that on the left.

Plymouth.

THREE CASES OF PLAGUE IN PREGNANT WOMEN; RECOVERY IN ALL THREE CASES.

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CAPTAIN I.M.S.; MEDICAL OFFICER IN CHARGE OF PLAGUE WARDS, ST. GEORGE'S HOSPITAL, BOMBAY.

As it has been stated by competent observers that during the epidemic of plague in Hong-Kong "every pregnant woman aborted and every woman who aborted died," it may be interesting to record the three following cases which have lately been under my care in the Plague Wards at St. George's Hospital, Bombay. Of these three women two came into hospital in a pregnant condition and one aborted at the beginning of the tenth day of her illness, while the other left the hospital without any abortion having occurred. The third case aborted before admission into hospital and soon after admission was considered by Dr. Yersin to be too far advanced to be injected with his serum.

CASE 1.—The patient was a woman, aged twenty years, a young Eurasian. She had been married eight months, had had no children and no miscarriages. She was admitted to hospital at 4 P.M. on Feb. 9th, 1898, after nearly twenty-four hours' illness. With regard to her history she awoke feeling quite well on the 8th, but soon after rising suffered from severe frontal headache and malaise. At 5 P.M. she had a rigor which lasted ten minutes and was followed by cramps in the hands and feet. At 6 P.M. she vomited profusely and first noticed a "painful lump in the left groin." The vomiting and fever continued unabated all night and till admission. During December and January she had had morning sickness, but it had ceased on Jan. 28th. There had been many cases of plague in her neighbourhood. On admission she was found to be a well-nourished young woman, with a flushed face, dilated pupils, injected conjunctivæ, and anxious though dull expression of countenance. The skin was hot and dry, the temperature was 105° F., the pulse was 130, soft and regular, and the respirations were 40, but quite regular. The tongue was covered in the centre with a silvery-white fur, slightly moist; the edges and tip were bright red. She lay on her back with both legs drawn slightly up and the left foot crossed over the right; her hands were extended above her head. She had scratches on both her feet. She complained of great frontal headache and cough. On examination all the abdominal and thoracic organs appeared to be healthy. Towards the inner part of the left femoral region was a mass of the size of a walnut surrounded by slight œdema and extremely painful on manipulation. The skin over it was not reddened and the swelling was quite distinct from the inguinal glands, which could easily be felt but were not painful. No other glandular enlargement was detected. The urine was very acid, of specific gravity 1018, no albumin and no sugar. On the 10th she had slept fairly well but could not retain her food. The bubo had increased in size and was more painful. The temperature had fallen to 101·2°, the pulse was 136, and the respirations were 32. She was extremely drowsy and resented being roused. In the evening her temperature reached 105·2° and the vomiting was more constant. On the 11th the vomiting was not relieved at all. The cough was much less. The bowels were opened after administration of calomel; large scybalous fæces were passed. She was very drowsy now as she had hardly slept all night. There was extension of the œdema to the left inguinal glands and the bubo was much more painful. No other glandular enlargement could be felt. The temperature in the morning was 103·8° and in the evening was 102·8°. Her condition continued much the same until the evening of the 12th, when she became delirious—low muttering—and continued so all night. The temperature on Feb. 12th in the morning was 103·8° and in the evening was 104·2°. On the 13th she was extremely weak and drowsy but not unconscious. When awake she was extremely nervous and difficult to manage. She vomited frequently, mostly after partaking of milk. The bowels were constipated. The physical signs were as before. The temperature in the morning was 100·2° and in the

evening was 105·2°. On the 15th the patient—who had been delirious for two nights but the previous night was violently so, constantly trying to get out of bed—was now quiet. She complained of cough and burning pain in the chest. On examination moist râles were audible on both sides, back and front. The abdominal organs were apparently normal. The bowels were opened daily after small and frequent doses of calomel; they were semi-solid and very offensive and yellow in colour. The pulse was 140 and dicrotic. The temperature in the morning was 103·0° and in the evening was 102·6°. Pain and distension of the abdomen began in the afternoon, but had been relieved by turpentine enema and stupes. On the 16th there was no pain in the chest. The cough was almost absent; there was no headache; she was quite conscious but extremely weak. The temperature in the morning was 102·0° and in the evening 101·8°. On the 17th the patient—who had slept well during the previous night—was much exhausted after vomiting her meal of broth at 8 P.M. The signs were the same as before, but the bubo was less œdematous and more painful. There was slight abdominal distension and pain. Towards evening the pains in the abdomen had increased and at 8 P.M. they were extremely severe. At 3 A.M. sudden bearing-down pains occurred and she aborted at 5 A.M. (fœtus of three and a half to four months). The placenta was slightly adherent and was removed by the finger. There was slight hæmorrhage afterwards. The temperature at 8 A.M. had fallen to 99·4° and the patient seemed quite comfortable and much relieved; she was sleeping soundly. The evening temperature was 102·0°. On the 18th the vaginal discharge was free, sweet, and alkaline, and yellow in colour. (Perchloride of mercury, 1 in 2000, was used as a vaginal douche night and morning.) The patient was comfortable though her temperature had risen. The temperature in the morning was 100·8° and in the evening was 102·4°. On the 19th she had slept well. The discharge was yellowish red, thick, and slightly offensive. The right eye was affected with iritis. There was no pain elsewhere except in the bubo. The temperature in the morning was 101·8°, and in the evening was 103·2°. On the 20th the vaginal douche was used thrice daily as shreds of membrane and placenta were coming away. The pain in the bubo was very great. The patient had severe headache all day. The temperature in the morning was 101·6° and in the evening was 102·6°. On the 22nd the temperature had reached normal and kept fairly low. The vaginal discharge was sweet and scanty, yellowish, and thin. There was much pain in the right eye and the pupil was irregular, with surrounding chemosis of the conjunctiva. The tension of the right eye very much increased. The temperature in the morning was 99·2° and in the evening was 99·2°. On the 23rd a drop of pus was let out of the right eye and afforded instant relief. The bubo showed signs of commencing suppuration. The temperature in the morning was 98·4° and in the evening was 98·8°. On the 25th the bubo opened and about 1 oz. of creamy pus escaped. The general condition was much improved. From this date the patient continued to rally in strength; on the 25th vaginal discharge entirely ceased and though the bubo was long in healing she wa soon able to sit up in bed and take solid food. The temperature remained low and hectic in character for about two weeks and then fell to normal. The patient was discharged from the plague wards on March 12th, only slight iritis remaining to worry her.

Bacteriological examination.—On Feb. 10th bacilli resembling those of plague were found by puncture of the bubo and microscopical examination of the lymph exudation which escaped. A culture was made on slanting agar-agar and showed numerous colonies of plague bacilli (examined and proved both microscopically and by experiments on mice) the next and second day. On the 15th the blood was examined both microscopically and by stroke cultivations on agar-agar. No colonies of any sort were found.

Treatment consisted mainly in stimulating liquid diet and good nursing. Milk, as much as she could take, with strong beef-tea, egg-flip, &c., formed her staple food. Thirst was relieved by ice to suck. Medicinally from the first she was put on a mixture containing 3 minims of carbolic acid, 5 minims of tincture of iodine, 2 drachms of mucilage of gum acacia with water to 1½ oz. This was given every three hours for the first day and after that four times daily till Feb. 14th. A boric acid fomentation was kept continually on the bubo and helped greatly to relieve the pain. Whenever the temperature rose to 104° she was sponged down with weak vinegar and water and the wet pack was resorted to when it reached 105°. As cardiac stimulants brandy and strychnine were freely given. Digitalis proved very useful in slowing and regulating the pulse-rate. Other treatment for cough, vomiting, constipation, &c., was purely symptomatic. To produce sleep and quiet delirium morphia and atropine given hypodermically proved far more effective than hyoscine, bromidia (which is far too depressant for these cases), or other drugs. Tonics and oleum morrhuæ were given during convalescence.

CASE 2.—The patient was a woman, aged thirty-four years, who first came under my care and then under that of Surgeon-Colonel J. Arnott, physician in charge of St. George's Hospital, Bombay, by whose permission I publish the notes of her case. On Feb. 11th, immediately after breakfast at 10 A.M., she felt giddy and sick and took to her bed and while undressing noticed her left femoral glands to be swollen. In the afternoon fever supervened and these symptoms continuing all night she was sent to hospital and was admitted at noon on the 12th. She had no rigor or vomiting. Menstruation had not occurred for nearly three months and she considered herself pregnant. On admission she appeared to be dull, lying in a crouching attitude with her legs drawn up and her head forwards on to her chest. The skin was hot and dry; the temperature was 104·4° F.; the pulse was 120, soft and feeble. The tongue was furred, white in the centre, with the tip and edges irritably red (typical). The thoracic and abdominal organs were apparently healthy. In the left femoral region two glands were found enlarged to the size of a hazel-nut each and they were very tender. There was no other glandular enlargement. On the 13th the patient had slept badly and now had great frontal headache. The glands in the left femoral region remained the same. The specific gravity of the urine was 1022; it was very acid; there was no albumin and no sugar. The temperature in the morning was 102·4° and in the evening was 102·0°. On the 14th the patient's headache prevented her sleeping, though she was distinctly dull and drowsy. The urine was neutral and contained phosphates in large quantity. The temperature in the morning was 101·6° and in the evening was 102·0°. On the 16th the patient was very weak. Her face had an "earthy" hue and she looked extremely dull and drowsy. The buboes were more painful and swollen. The physical signs were the same as before. The temperature in the morning was 100·2° and in the evening was 102·6°. On the 17th the temperature had reached normal and the patient said she felt much better, but her appearance and signs remained unaltered. From this date she made an uninterrupted recovery, the glands undergoing complete resolution, and she left the hospital well in a fortnight.

Treatment was practically the same for this case as for the former one, except that for the first twenty-four hours she was given the carbolic acid and iodine treatment mentioned above; but after that, when under Surgeon-Colonel Arnott's care, 15 minims of solution of chlorine in water every six hours was substituted and seemed to agree very well. Other treatment was mainly symptomatic.

No microscopical or bacteriological examination was conducted in this case, but from the clinical symptoms and the fact that she had attended on one of her servants who had suffered and died from this disease there seems to be absolutely no doubt that she suffered from a mild attack of plague in its bubonic form.

CASE 3.—The patient was a married woman, aged thirty-one years, a Eurasian, living in a very infected district. She had had two children born at full time and no miscarriages. She was admitted at 6 P.M. on March 11th after three days' illness. With regard to her history, on the evening of March 8th she had felt pain in the right groin and had detected a small swelling there. The next day she did her household work, but at 4 P.M. suddenly had a severe rigor, which lasted nearly one hour and was followed by frequent vomiting, frontal headache and fever. At 3 P.M. on the 10th severe abdominal and bearing-down pains set in and she aborted at about 5 P.M. (fœtus three and a half months). A Hindoo medical attendant removed the after-birth, but apparently failed to diagnose the case though aware of the existence of the painful glands above mentioned. On admission the patient was found to be a thickly-set woman, with flushed face, dull expression, dilated pupils and congested conjunctivæ. She lay on her right side with both

legs well drawn up to the abdomen. The temperature was 104·6° F., the skin was hot and dry, the tongue was coated with a silvery white fur in the centre, the tip and edges were red and cracked; the breath was foul; the respirations were 28 and shallow; and the pulse was 124, but of fair volume. The thoracic and abdominal organs were apparently natural. The right femoral and inguinal glands were much enlarged, though distinct from one another, and they were surrounded by considerable brawny œdema. The whole tumour measured 3½ in. by 4½ in. and was extremely tender. The skin overlying it was slightly reddened and not moveable on the surface of the swelling, but no fluctuation could be detected. The lochia were very free, light yellow and sweet. The external os admitted the little finger; the internal os was dilated to admit the finger, by which means several small bits of placenta and shreds of membrane were removed. The cavity was washed out with a 1 in 3000 perchloride of mercury solution and similar vaginal douches were ordered twice daily. On the 12th, the morning after admission, the patient was seen by Dr. Yersin, who refused to inject her as he considered her case to be hopeless. The temperature had remained high, but the lochia were sweet and the pain in the bubo was slightly less. The urine was dirty yellow, of specific gravity 1020, slightly albuminous, and neutral. On the 13th, though much improved in the morning, she became very restless towards night and at 11 P.M. complained of severe pain in both iliac regions. On examination no swelling was detected. The temperature in the morning was 102·0° and in the evening was 104·8°. On the 14th there was no more pain in the abdomen, she looked much better, and the bubo was considerably enlarged in size. The temperature in the morning was 103·0° and in the evening was 102·4°. On the 15th, the temperature remaining high, she was given 10 gr. of antefebrin in brandy at night. This greatly relieved the headache as well as being effectual in reducing the temperature 3° F. On the 17th the bubo was opened. Caseous pus and blood escaped. Beyond copious sweating she complained of nothing. There was no pain and no other swellings were detected. The temperature in the morning was 99·6° and in the evening was 101·0°. From this time the patient progressed quite favourably. On the 22nd the incision in the bubo was considerably enlarged and two more suppurating sacs were opened. On April 1st she was discharged well.

Bacteriological examinations of her blood were made on March 12th and 16th, but the agar tubes remained perfectly sterile. On March 17th cultures on slanting agar were made from the caseous pus and yielded many colonies of plague bacilli and a few streptococci, which were examined microscopically.

The treatment in this case was practically the same as in Case 1 and needs no further comment.

I have to thank Dr. Bitter of Cairo and Professor Gaffky for their kindness in allowing me to work in their laboratory and for confirming the bacteriological and microscopic investigations of the above cases. I am also indebted to Assistant Surgeons Lafonde, Netscher, and Macgregor of St. George's Hospital, Bombay, for their help in observing these cases clinically.

Bombay.

WIGAN MEDICAL SOCIETY.—A meeting of this society was held on Sept. 8th, 1898, Mr. Wm. Berry, F.R.C.S.I., President, being in the chair.—Dr. Blair read a paper on the Serum Treatment of Puerperal Septicæmia, which he illustrated with copious notes from a successful case in his own practice. The usual methods of treatment were also adopted throughout. Anti-streptococcic serum was used. The serum was best employed early in the disease and then towards evening, and in all cases collapse must be watched for and obviated. The belief was expressed that recovery from puerperal septicæmia treated with serum would be more thorough than with other methods alone.—Dr. Blair said it was desirable that the serum should be of standard strength and purity so that definite results could be obtained.—In the discussion on the paper the following gentlemen took part: The President, Mr. Parker, Mr. Jones, Mr. Graham, Mr. Monks, Mr. France, and Dr. Rees and Dr. Benson.—Dr. Blair replied.—A vote of thanks to Dr. Blair for his paper was moved by Dr. Benson, seconded by Mr. Monks, and carried unanimously.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A NOTE ON THE OCCURRENCE OF CARTILAGINOUS AND BONY NODULES OF THE TONSILS.

BY WYATT WINGRAVE, M.R.C.S. ENG.,
ASSISTANT SURGEON AND PATHOLOGIST TO THE CENTRAL LONDON THROAT AND EAR HOSPITAL.

IN an article published in THE LANCET of August 13th last Dr. Hugh Walsham drew attention to the existence of cartilage and bone in the faucial tonsil and expressed the opinion that they were vestigial in origin, whilst Dr. Kanthack believed that they were due to some metaplastic process. I am quite of the view that these cartilaginous masses originate in developmental vestiges and have always considered them to be identical with the subpharyngeal cartilage of Luschka, referred to in Macalister's "Anatomy,"[1] but with regard to the bony masses in some instances I am inclined to agree with Dr. Kanthack, since they are generally multiple, being often scattered about the substance of the tonsil and they are often associated with morbid changes in that structure. Still, Dr. Walsham's example of transition proves a possible chondral origin.

My experience is that cartilaginous nodules are by no means rare in this situation. Several years ago I exhibited sections at the British Laryngological and Rhinological Association and in January last further examples at the Laryngological Society of London.[2] These nodules were found accidentally during the microscopical examination of diseased tonsils—mostly chronic hypertrophy—removed from patients below twenty years of age. Dr. Walsham's were, however, associated in two instances with the more mature ages of twenty-seven and fifty years, Deichert's case being as old as seventy-seven years. As in those cases, the cartilage was hyaline and white fibrous, embedded in a dense connective tissue capsule, sometimes occurring in the fibrous "bed" and sometimes in the lymphoid pulp of the tonsil, but never in the lymph nodules or follicles. I have only found calcification in one instance and this was not truly osseous. It is interesting to note that in Dr. Walsham's cases the tonsils were atrophied and that the bony elements were in excess of the cartilaginous. There must be considerable difficulty in forming a true estimate as to the frequency in the occurrence of these "nodules," since they are generally found by accident; still I have no doubt but that a systematic search will prove them to be much commoner than is generally believed. It is not an unusual experience when operating to find considerable resistance to the guillotine quite disproportionate to the density of the tonsil tissue. This I have in several instances proved, by the aid of a pocket lens and the fingers, to be due to the presence of fibrous and cartilaginous tissue, which was confirmed by the microscope. The fact that all my cases were young subjects is, perhaps, sufficient explanation for their being solely cartilaginous, since in the second instance described by Dr. Walsham there was partial ossification. That these nodules may as "vestigial rests" be the possible and probable foci of neoplastic changes must not be ignored, and as they are of somewhat more than transcendental interest further research as to their frequency and association may prove valuable.

Devonshire-street, W.

CASE OF LARGE FATTY TUMOUR.

BY J. A. HAMILTON, M.B., C.M. EDIN.,
LIEUTENANT, I.M.S.

As cases of very large tumours are comparatively rare nowadays the following may be of interest. I am away from books of reference at present, but I do not think that

[1] A Text-book of Human Anatomy, by Alexander Macalister, 1889, p. 596.
[2] Proceedings of the Laryngological Society of London, vol. v., p. 34.

fatty tumours often reach such a size as the one described below.

The patient, a Manipuri, came to me in March, 1897, when I was officiating as civil surgeon in Manipur. He said he was forty years of age, but he looked more, and was very thin and feeble. He stated that the tumour had been present for about fourteen years, that it had first appeared on the back of his shoulder in the supra-spinous region, and that it had gradually attained its present position as it increased in size. It now hung from the right side of the thorax, the line of attachment crossing the posterior axillary line obliquely downwards and forwards. Looking at the patient from behind he gave the appearance of a *bhisti* carrying a *mussuck*. He stated that the tumour had not perceptibly increased in size during the last three years. He had tried all sorts of native medicines and applications, and finally, as he found it in every sense of the term a burden to him, he came to the Civil Dispensary to see if anything could be done for his relief. The nature of the tumour was made out without any difficulty and its removal recommended; to this he gladly consented. Accordingly a few days later I amputated it; I made an eliptical incision, turned the flaps back, and easily separated the tumour from its surroundings, removing it with most of its skin covering. The only difficulty lay in the number of very large superficial veins which had to be secured and in the size of the tumour, which made it very unwieldy and awkward to handle. I unfortunately made the flaps a trifle small, so, owing to tension, I had to cut two stitches next day, but even with this the wound completely healed within three weeks. The tumour was carefully weighed half an hour after removal and it turned the scale at just over 37½ lb. I saw the patient two months later. He was very fit and had put on weight, he could get about easily and had even been playing polo, a thing he had not been able to do for years.

Gantok, Sikkim.

[The above article was accompanied by photographs of the patient taken before removal of the tumour. It had the appearance of an enormous pyriform mass larger in circumference than the man's waist, projecting backwards and sideways so much that it could be seen in whatever position he stood with reference to the observer.—ED. L.]

IPECACUANHA IN A CASE OF EPILEPSY.

BY C. KNOX BOND, L.R.C.P. LOND., M.R.C.S. ENG.

THE treatment of epilepsy remains so unsatisfactory that any suggestion derived from the treatment of individual cases of this malady may possess some therapeutic value.

The following note refers to an unmarried woman, aged twenty-nine years, a patient at the St. George's and St. James's General Dispensary, who had been subject to epileptic fits from the age of eight years. When the fits first commenced they were described as "faints," but from the onset of the catamenia they assumed a more serious form, when she was taken to a special hospital for nerve diseases for a period of six months and was said to have received no benefit from treatment. She was then treated at a general hospital continuously for two years and since then has been more or less under treatment at the hands of several physicians. On July 14th, 1897, she was admitted to the above institution under the care of Dr. Alfred Eddowes, who found that she had taken continuously for a long period large doses of bromide without, according to the statement of her mother, diminishing the number or severity of the fits. Dr. Eddowes therefore decided to reduce the bromide to a third of the former dose and added vinum ipecacuanhæ to the prescription. A dose of 10 minims was commenced with, increased from time to time as the fits recurred until a dose of 40 minims three times a day was reached. With each increase of ipecacuanha there was a marked improvement in the patient's condition. The severity and frequency of the fits had diminished under this treatment until May 3rd, 1898, since when no fits have occurred. The patient's mother stated that her daughter had never enjoyed so long an immunity from fits at any previous period since their commencement.

The reasons which led Dr. Eddowes to adopt this treatment were based, firstly, on his observation in his former private practice as to the value of ipecacuanha in convulsive attacks of children apparently due to gastro-intestinal irritation; and secondly, that it seemed a likely remedy to check the voracious appetite and neglect of mastication so frequently observed in epileptics. The marked improvement with this treatment so noticeable in a very intractable case under my observation for nearly three years leads me with Dr. Eddowes's concurrence to submit this brief note for publication in THE LANCET.

King-street, W.

A Mirror
OF
HOSPITAL PRACTICE,
BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

GREAT NORTHERN CENTRAL HOSPITAL.

A CASE OF GASTRO-JEJUNOSTOMY IN WHICH THE ARTIFICIAL OPENING WAS SURROUNDED WITH A TRIPLE ROW OF SUTURES AND LINED WITH MUCOUS MEMBRANE.

(Under the care of Mr. C. B. LOCKWOOD.)

THE best method of uniting two portions of the alimentary canal has been much discussed in recent years. There are at present two chief parties; first, those who advocate the employment of only a needle and suture, and those who call in the aid of various mechanical appliances. By a needle and suture it is quite possible to unite two pieces of intestine completely and successfully, but even the most ardent supporters of this method must acknowledge that in some cases at least the process is lengthy. The advocates of the employment of "apparatus" in enterectomy or gastro-enterostomy claim that the duration of the operation is materially shortened. It is true that some little time is saved in the operation, but the presence of the "apparatus" is in itself a danger. In some cases it may be important to terminate the operation at the earliest possible moment; in these a Murphy's button or other "apparatus" may be usefully employed, but if it be possible safely to prolong the operation a simple suture will offer less chance of troublesome complications. The method of suture employed by Mr. Lockwood in the following case is ingenious, and a very thorough joint results; the only possible objection which can be raised is that the operation requires no small amount of time; but practice in the method would go far to obviate this objection. Gastro-jejunostomy is a valuable, though of course only a temporary, method of treatment of cases of malignant disease of the pylorus, in which no attempt at removal can be made. It is also of permanent value in cases of non-malignant pyloric obstruction, but for this condition a Heineke-Michulicz operation is usually preferable.

The patient, a man, aged fifty-four years, said that he had had syphilis in his youth, but otherwise his history was good. He had not been a hard drinker. In October, 1895, he began to have dyspepsia and pain after food. In November he vomited occasionally after food; soon he began to vomit all solid food; and when he was admitted to the Great Northern Central Hospital on Jan. 1st, 1896, he had commenced to vomit liquids. No blood was seen either in the vomit or in the motions. A rapid loss of weight accompanied this illness, so that he had become exceedingly emaciated and so weak that he had to be carried into the ward. A hard ovoid swelling, the long diameter of which was about 3 in. and the short diameter 2½ in., was easily felt through the thin abdominal walls beneath the eighth right costal cartilage and in the situation of the pylorus. The stomach was dilated and reached before the level of the umbilicus. A succussion splash could be heard and felt. The tumour of the pylorus was rather tender and moved freely with the descent of the diaphragm. It was soon ascertained that all the fluids which the patient swallowed were vomited mixed with gastric juice

and having a very sour and unpleasant smell. He was made more comfortable by washing out the stomach, but in spite of rectal feeding he said that he felt starved. Dr. Clifford Beale, under whose care the patient had been admitted, requested Mr. Lockwood to see him with a view to an operation being performed. As he was eager to obtain relief from his horrible sufferings endeavours were made forthwith to diminish the size of his stomach and to improve its condition by daily washing it out with boric lotion. Mr. H. Randall Wadd carried this out with great assiduity and without a doubt much is due to his efforts. After the patient had been under observation for a fortnight and with little alteration in his condition Mr. Lockwood performed the following operation. A vertical incision about 5 in. long was made through the centre of the left rectus abdominis muscle so as to expose the front of the stomach. This incision began about an inch below the left costal margin. It was at once ascertained that at least 5 in. of stomach and jejunum would have to be resected to take away the disease; also an enlarged lymphatic gland was felt in the gastro-hepatic omentum. As there was no prospect of the patient bearing such a formidable operation the commencement of the jejunum and the front wall of the stomach were drawn out of the wound and the great omentum was pushed back with a flat sponge. The stomach and jejunum being now held together were sewn to one another for three inches by a row of interrupted silk sutures. All of these were cut short except the two end ones. These being left long were a useful landmark and helped to steady the stomach and bowel. This first row of sutures only transfixed and fastened together the peritoneum. It was parallel to the great curve of the stomach and to the mesenteric edge of the jejunum and about half an inch from both. The peritoneal row of sutures having been inserted an incision at least one and a half inches long was made through the peritoneal and muscular coats of the stomach and jejunum. This cut was the beginning of the artificial opening and was a third of an inch from the peritoneal row of sutures and opposite its middle part. It brought the mucous membranes of the stomach and of the jejunum into view. These mucous membranes were easily separated from the muscular coats of the stomach and jejunum for about a third of an inch all round the incision.[1] When this had been done the peritoneal and muscular coats of the stomach and of the jejunum were sewn together with a row of interrupted sutures parallel to the row in the peritoneum. When the second row of sutures had been cut short the stomach and jejunum were both opened by cutting through their mucous membranes. These were sewn together by a row of interrupted sutures parallel to the last two rows. By this stage of the operation openings had been made into the stomach and jejunum and the edges of the opening next to the great curve of the stomach and next to the mesenteric border of the intestine had been sewn together by three parallel rows of sutures—the first through the peritoneal cone, the second through the peritoneal and muscular coats, and the third through the mucous coat. At this stage two of these rows of sutures (the first and the second) were hidden from view, but the last was still in sight, having been tied on the inner mucous surface of the stomach and jejunum.

Although rather difficult to describe the operation is quite simple up to this point and quite easy to perform. Briefly, an opening has been made into the stomach and into the jejunum, and one side (the lower) of the opening has been fastened together with three rows of interrupted sutures. To complete the operation it is only necessary to sew together the other side (the upper) of the opening. This is easily done by sewing together (1) the mucous membrane, (2) the muscular and peritoneal layer, and (3) the peritoneal. In sewing together the mucous membrane nearly all the sutures can be tied on the mucous surface with the exception of the last. The suture of the muscular and peritoneal coat and of the peritoneal coat alone presents no difficulties whatever. The result is an opening from the great curve of the stomach into the jejunum. This opening is lined with mucous membrane and is big enough to admit easily the end of the thumb. The three rows of sutures effectually prevent leakage and are strong enough to guard against the muscular contractions of the stomach and jejunum.

[1] The above method of opening the stomach and jejunum has, Mr. Lockwood finds, been used by Mr. F. Barker and subsequently by Mr. Jessett, Brit. Med. Jour., June 2nd, 1888, p. 1115.

The final stages of this operation were the return of the stomach and jejunum and the closure of the abdominal wound. The whole proceeding took about a little more than an hour, but it was the first time that it had been done and neither the operator nor the assistant were experienced in it. Subsequently the same operation was performed in forty-five minutes upon a patient under the care of Dr. Galloway. It is not quite safe to put continuous sutures into distensile organs, but, nevertheless, in the next case Mr. Lockwood will endeavour to save time by using short lengths of continuous suture.

The after progress of the case was as follows. The shock was very slight, great care having been taken to keep the patient warm during the operation and to ply him with nutrient enemata containing brandy. The next day feeding by the mouth was begun with peptonised meat essence and peptonised milk and milk-and-soda-water. The second day after the operation the patient twice vomited some fluid mixed with bile and gastric juice. The vomiting ceased as soon as his stomach was washed out. His nourishment was gradually increased until the tenth day, when an untoward accident, fortunately attended with no ill result whatever, occurred. With Mr. Lockwood's consent the abdominal sutures were taken out. That evening the patient coughed and strained and a piece of bowel was protruded from the wound. This was replaced and the wound was brought together and healed without any suppuration. It is clear that allowance ought to have been made for the slowness with which wounds heal in such emaciated patients. Moreover, there was no reason why the sutures should not have been left in for another week or ten days. Ten days after the operation the patient took pounded meat and fish without any vomiting and each day he made steady progress. It was found advisable, however, to wash out the dilated stomach occasionally and on Feb. 2nd he walked home. He could then eat an ordinary diet without vomiting. It seemed to be a great pleasure to him to drink beer again. He attended from time to time during 1896 and in October he vomited occasionally. This was attributed to his diet, which consisted of beer, cheese, herrings, and so forth; but in spite of all he had gained 4 lb. in three months. When admitted into the hospital and fed on a light nourishing diet he ceased to vomit and soon improved and was able to help with the ward work. His stomach also required to be washed out, but no dilatation could be discerned. The patient was shown at the Medical Society of London on Nov. 9th, 1896. On Jan. 4th, 1897, he still maintained his ground and so far as could be discovered the pyloric growth had made hardly any progress. He looked well and said he had continued to gain weight.

Remarks by Mr. LOCKWOOD.—The above case illustrates a method of sewing together the intestine and stomach in gastro-jejunostomy. I used it twice during the year 1896. Although at first a little more time may be required for its application, nevertheless it seems to promise to be more secure than other methods and to have the advantage of lining the artificial opening with mucous membrane. In the operations by sewing or by using decalcified bone plates, the cut surfaces of the mucosa and serosa of the stomach are left exposed to the corrosive action of the gastric juice. This has always seemed to me to be a great risk, and has probably been the cause of some of the fatal results. But it has to be allowed that apart from this danger the operation of gastro-enterostomy is as yet likely to have a considerable mortality. At present surgeons are called upon to operate when the patients are emaciated to the last degree, worn out with perpetual vomiting, and in the very worst state for an operation which makes demands upon their powers of repair. But it is hard to refuse to make an attempt when there is the faintest chance of relieving, if only for a time, such horrible sufferings.

As yet the operation of gastro-jejunostomy is comparatively rare. In 1892 Mr. Jessett[2] collected 17 cases and in 1894 Mr. Bidwell[3] added 15 more, all done in this country. No doubt when the striking benefit of gastro-jejunostomy is properly recognised it will be done oftener and earlier. From what I have seen of three cases under my own care and of several operated upon by other surgeons the method of operating may be improved upon. Although the delay had been slight yet it is probable that my patients would have been more comfortable after the operation if the stomach

[2] Transactions of the Clinical Society of London, vol. xxv.
[3] Ibid., vol. xxvii.

had not been so dilated. Mr. Richard Bevan[4] has very convincingly urged that the operation should be performed as soon as the dilatation is diagnosed. In the two cases, which he evidently watched with much solicitude, great discomfort arose both before and after the operation owing to that condition. But he adds that "the benefits, in spite of discomfort, were enormous."

At present it is the custom with many surgeons to unite the stomach and jejunum with a mechanical contrivance such as a Senn's plate or Murphy's button. The last-named is probably the most popular. It is easier to use than the decalcified bone plate and does not take quite so long to apply Senn's plates have been used less often since cases have been recorded by Stansfield, Larkin, and others of closure of the artificial opening. Cases reported by Keen[5] and Morton[6] show that the button may not be quite free from this danger, but the risk seems to be small. But apart from this the metallic button has to traverse the whole length of the small and large intestine and this journey is often delayed or not completed. In some cases the intestine has sloughed beyond the button[7] and twice for reasons which are not given. Dr. Wiggin[8] mentions a case in which the button stuck in the small intestine and had to be removed by laparotomy, also one in which the weight of the button bent a loop of intestine until it became obstructed, and one in which the button was plugged with hard fæcal matter. The actual success after the use of buttons and mechanical contrivances is not easy to ascertain. Dr. Murphy[9] includes as recoveries patients who died "eleven days later from complication," "four weeks later from diarrhœa," "died fourteen days after, pneumonia," and so on, because the union was good. If the cases of suture were taken in the same way a high proportion of recoveries would be obtained. Indeed, according to the late Mr. Greig Smith[10] Hahn has had fifteen gastro-enterostomies, and Doyen eighteen without a death, neither operator having used any apparatus. Union by suture ought to appeal very strongly to the surgeons who think with Desault "that the simplicity of an operation is the measure of its perfection." A needle and thread are always at hand. A few days after the operation the result has declared itself and no anxiety is felt regarding the passage of the button through the intestines, or lest it may leak, or cause ulceration or sloughing, or become plugged with fæces. On the other hand, when suture fails it is usually due to bad sewing, as I think was the fact in one of my own cases. Those who sew cannot comfort themselves by blaming the button, or the bobbin, or the plate. The chief objection to sewing is the time it takes. But the time can be much shortened by careful organisation and by skilful rapidity, and shock is now less severe as hot tables are used and hypodermic injections of strychnine are given and brandy is administered by the rectum. Anæsthetics, too, are now used with much greater skill.

LEEDS GENERAL INFIRMARY.

A CASE OF PERINEAL ABSCESS; PYÆMIA TREATED WITH ANTI-STREPTOCOCCIC SERUM; RECOVERY.

(Under the care of Mr. LAWFORD KNAGGS.)

IN the following case the anti-streptococcic serum was employed with a most satisfactory result. No doubt at the present time the serum is given in many instances where it would not be thought to be indicated if all the facts which might be elicited were known. Only few hospitals possess the equipment which enables general bacteriological work in connexion with cases in the wards to be carried out with promptitude, and as time in severe septic infective diseases is often of great importance the surgeon naturally feels that he must not delay the use of a remedy which may be powerful for good if used in time and which fortunately does not as a rule seem to do harm in inappropriate cases. For the notes of the case we are indebted to Mr. J. Victor Hartley, house surgeon.

A man, aged forty-three years, was admitted on Feb. 9th, 1898, with a perineal abscess of unusual size, which formed a prominence in front at the root of the penis and had burrowed into both ischio-rectal fossæ behind. There had been no retention of urine, but the urethra was found to communicate with the abscess cavity through an opening 1 in. long the result of sloughing. Subsequent progress was uneventful until March 29th. At this time the perineal wound was small and Lister's metallic sounds were being passed daily. On March 29th No. 9–12 was passed for the first time and caused a little bleeding. In the afternoon the patient had a rigor and his temperature rose to 103·6° F. The next day the scrotum was œdematous and a second rigor occurred at 8 P.M. (temperature 104°). On the 31st a considerable quantity of pus escaped from a closed drainage-tube wound at the root of the penis. After this the scrotal condition quickly settled down and gave no more trouble. There was a third rigor on this day (temperature 103·6°). On April 1st he had a fourth rigor (temperature 106°) and an abscess began to form over the left olecranon. There were no abnormal sounds in the chest. It was decided to employ the anti-streptococcic serum, but there was some delay in getting it. The abscess was opened on April 2nd. The pus was stained and numerous micrococci were found. On the 3rd the temperature was 105·4° at 10 P.M., and though no rigor was noticed the patient was very ill during the night and sweated profusely. On the 4th the serum treatment was begun, 10 c.c. were injected over the abdomen at 8.30 P.M., shortly before the time at which a rigor was expected. The same dose was repeated every day except on the 6th, 9th, and 16th till the 18th. It never caused any untoward symptom beyond the pain due to the large quantity of fluid injected. About this time rhonchi were heard over both lungs and for several days there was a good deal of bronchitis and cough. There was also marked hæmoptysis, but this was present only on April 5th and 6th. On the 8th the chest condition had almost entirely cleared up, but at the angle of the right scapula sibilant rhonchi and crepitations could be heard over a small area. By the 10th an occasional cough was the only sign of lung trouble left. On the 11th an abscess which had been forming over the outer condyle of the right humerus for three days was opened. From this date the patient mended rapidly, no further local manifestations developed, and an inflammatory patch in the subcutaneous tissue on the inner side of the patella, which was first noticed on April 6th, gradually subsided without suppuration. The excursions on the temperature chart had been steadily but slowly diminishing from the commencement of the serum treatment, and after the 19th never rose above the normal. No serum was given after the 18th. On the 22nd the passage of soft bougies was begun and on the 30th the patient went home with a slight fistula at the root of the penis which quickly closed. He was seen on August 2nd. He was quite well and passed a No. 11 bougie for himself regularly.

Remarks.—The position of the subcutaneous abscesses in the neighbourhood of both elbows suggests a traumatic rather than an embolic origin. In other words, that laceration of capillaries led to minute extravasations of blood containing micrococci. On the other hand, very little doubt was felt that the lung condition pointed to embolic plugging of vessels which would have resulted in metastatic abscesses if the serum had not been given. Abscesses of embolic origin, besides being more liable to occur in inaccessible situations and to interfere with vital functions, point to the existence in the circulation of masses of micro-organisms unable to traverse its smaller ramifications and would seem to indicate that the septic process had reached a point beyond the protective powers of the body to cope with successfully. Here, therefore, the gravity of the prognosis was distinctly increased as soon as the lung condition developed. The effect of the serum upon the chest symptoms was very marked. They completely subsided in two or three days under this treatment alone. When the lung condition, which presumably never reached the suppurative stage, had subsided, and after the progress of an inflammatory focus near the right knee had been effectually checked, an abscess developed near the right elbow and had to be incised. This no doubt was of the traumatic variety. It might be argued that micro-organisms when once outside the circulation are not so easily brought

[4] A Plea for Early Operation in Dilated Stomach due to Pyloric or Duodenal Obstruction.—THE LANCET, Sept. 26th, 1896.
[5] Annals of Surgery, vol. xvii., 1893, p. 663.
[6] Brit. Med. Jour., vol. ii., 1895, p. 631.
[7] In a case under the care of the late Mr. Greig Smith the patient died on the third day from a sudden shock. Two gangrenous rings of bowel within the button flanges were all that could be found to account for death. Abdominal Surgery, 5th edition, vol. ii., p. 631.
[8] New York Medical Journal, Dec. 1st, 1894.
[9] THE LANCET, April 27th, 1895.
[10] Abdominal Surgery, fifth edition, p. 538.

under the influence of the antidote as those within the vascular channels, yet it must be confessed that the appearance of this abscess, when other inflammatory foci—traumatic as well as embolic—had given way under the influence of the serum, is not easy to understand. There were no rigors after the serum was commenced, but there were the daily elevations of temperature and profuse sweatings which are characteristic of the pyæmic state. These gradually diminished each day and in fifteen days from the beginning of the treatment the patient was convalescent. Had the daily dose of serum not been omitted on two or three occasions this period would no doubt have been shortened.

WESTERN INFIRMARY, GLASGOW.

A CASE OF RUPTURE OF THE PATELLAR LIGAMENT; SUTURE; RECOVERY.

(Under the care of Dr. D. MACARTNEY.)

IT is always difficult to say definitely why in one case a fracture of the patella, in another a rupture of the tendon of the quadriceps extensor muscle takes place, while in a third the ligamentum patellæ suffers. That the patella should be fractured by muscular action it is necessary that the knee should be strongly flexed at the time of the contraction of the muscle and one of the other two lesions is liable to occur if the knee is extended. In the case recorded below it is very probable that the blow on the knee was the real cause of the ligament giving way, for there is no evidence that the rupture resulted from muscular contraction. As to the treatment to be adopted for this rare injury there can be no doubt that an aseptic operation offers the best chance of a thoroughly useful limb; for the ligament is even less likely than a fractured patella to unite after having been torn in two.

A man, aged fifty-four years, by occupation a lamp-lighter, was admitted to the Western Infirmary, Glasgow, on Dec. 4th, 1895, suffering from the effects of a fall from his ladder on to the pavement, his knee striking the ground first. On examination the patella was found to be quite normal in shape and size, but drawn up the thigh for nearly two inches, leaving a distinct hollow at the upper part of the tibia. The patient could not extend the limb, and the swelling in and near the joint was well marked. The limb was fixed temporarily on a long splint in order to allow the effusion into the joint to pass away. A week after admission (Dec. 11th), the patient being under chloroform, a vertical incision was made over and below the patella of sufficient length to expose the parts. It was then found that the ligament with the capsule of the joint was torn across in its whole breadth in a ragged line just below the apex of the patella. The under surface, the capsule of the joint, was first dealt with by paring the irregular edges with scissors and uniting the pared edges by means of a fine continuous catgut suture. The ligament proper, which showed the same raggedness of edge, was similarly dealt with, the suture being of the same material but stronger. The parts having been cleaned the superficial vertical wound was brought together by means of salmon-gut sutures, dressings were applied, and the limb was fixed in an osteotomy splint, which was raised on a block when the patient was put to bed. For a day or two he complained of pain and uneasiness, but as his temperature kept normal it was thought right not to disturb the dressings. On the 20th, nine days after the operation, the dressings were removed and the wound was found to have healed; half of the stitches were removed. On Jan. 7th, 1896, the splint was removed. On the 22nd the patient was allowed to get up and two days later was permitted to go home. Four months afterwards he visited the infirmary to report himself. The limb was quite well, the patella was in its proper place and his walking was good. He had resumed work and felt no difficulty in the use of his injured limb.

Remarks by Dr. MACARTNEY.—Rupture of the patellar ligament is of comparatively rare occurrence, and on that account alone the record of such a case is interesting; all the more if the steps taken to treat the condition showed more clearly the pathological state of the parts involved, which the case described above did. In such recorded cases as I have come across in my reading the rupture has been near the tibial insertion; in some cases the ligament has torn away its bony attachment. In Holmes's "System of Surgery" cases recorded by Spence, Chiene, Toogood, and Shaw are referred to. In only one of these—namely, that reported by Shaw—has the rupture been at the patellar end of the ligament. The thing which struck me as being most noteworthy was the stringy, ragged appearance of the wound in the ligament.

Reviews and Notices of Books.

Die Zelle und die Gewebe. Zweites Buch von Professor Dr. OSCAR HERTWIG. Mit 89 Abbildungen im Text. (Cell and Tissue. Second Book. By Professor OSCAR HERTWIG. With 89 Illustrations in Text.) Jena: Verlag von Gustav Fischer. 1898. Pp. 314. Price 7*s.*

THE author having in a previous work given an account of the chemical, physical, morphological, and biological characters of the "cell" now takes up the physiological side of the process of development, dealing especially with the mode of origin of the tissues and the physiological causes of the formation of the structures and organs of the body. He shows how the cells unite to form the individual, the mutual influence they exert upon each other in point of physical characters and function and the mode in which they become differentiated for the performance of the duties they have to discharge. He shows how cells respond to external agents and that even in the case of the ovum the process of development is not a mere unfolding and increase but that the ultimate product is the result of the action of many external and involved factors, that variations of temperature, of light, and of food in the earlier stages exert in different instances potent influence on the growth, external characters, and life of the adult. Thus, in the matter of temperature he gives drawings of four ova of the frog respectively kept for three days at a temperature of 10° C., 15°, 20°, and 24°. In the first the ovum is shown to have only reached the gastrula stage, in the second the medullary plates are seen to have formed, in the third the primary gills appear with the rudiment of a tail, whilst in the fourth the external branchiæ are fully formed and the tail has attained considerable length. Similar effects of variations of temperature are seen in the seasonal dimorphism of many butterflies, quoting the interesting observations of Professor Eimer upon a little butterfly, the Lycæna agestis, which is widely spread and which exhibits dimorphism in accordance with the season. In Germany the insect has a winter and a summer form, which may be designated A and B, but the same insect appears in Italy also with two seasonal forms, B and C. The form B thus appears in both climates, but in Germany it is the summer and in Italy the winter form. The German winter form does not occur at all in Italy whilst the Italian summer form does not occur in Germany. Hence it may be concluded that the various forms are associated with variation of temperature.

So with chemical agents, the differences presented by flowers growing in different soils is well known to gardeners. Iron, Professor Hertwig points out, is essential for the formation of chlorophyll by plants; without this element chlorosis supervenes and if it be then supplied indications of recovery become apparent in 24 hours. So Knop found that on feeding plants of maize with certain sulphites the resulting form was so different from the ordinary one that it might quite easily have been described as a new species. Nor is the influence of chemical agents less obvious in the case of animals. The effects of arsenic and phosphorus fumes are the subjects of present legislation, and the fact that the absence of lime is a fertile source of disease is familiar knowledge. The changes caused by an increase or decrease of salt in the brine

shrimp Artemia, the alteration effected in Whitstable oysters when transported into the Mediterranean, the influence of exclusive feeding of certain butterflies on lactuca or on atropa belladonna in changing their colouration, the practice of modifying the colouration of the feathers of certain birds by the natives of the Amazons by the substitution of the fat of some kind of fish for their ordinary food, the effects of small quantities of lithium on the development of the larva of sea urchins and of the changes effected in development of frogs' and axolotls' ova in a 6 or 7 per cent. solution of common salt, in the production of anencephaly and hemicrania, with many other facts, are collected in a very interesting manner. The subject of the influence of the internal factors of organic development is treated with equal fulness of detail.

Professor Hertwig concludes his work with a short account of the different theories that have been advanced since the appearance of Darwin's book and finishes with the following account of his own views, which we have taken the liberty to slightly abbreviate: The cell with its properties is the elementary living being; it is the carrier of the idioplasm and thus corresponds to Herbert Spencer's "physiological unit"; owing to its collective activity it brings forth the different kinds of plants and animals. Inasmuch as all organisms in the course of their development pass through the one-celled condition the cell must possess in their simplest form all constant and essential characteristics by which the several species are differentiated. There are therefore as many fundamentally different kinds of cells as there are different species of plants and animals. The essential character distinguishing these different cells are hidden from our knowledge; we can only on logical grounds presume that the cell possesses an extremely delicate organisation, and that the highly organised substance which determines the species of cell and was called "idioplasm" by Nägeli is only a small part of the total cell substance and, on Professor Hertwig's hypothesis, is included in the nucleus. The agreement between the different individuals of each generation or the continuity of development is effected by the circumstance that every individual proceeds from a single cell. The question then arises how out of the cell and its invisible peculiarities the compound organism with its visible peculiarities proceeds. And the answer given by biogenesis is that it is through the multiplication of the specific cells and the coincident processes of social union, division of labour, and integration. A physiologically fundamental character of every form of life is the faculty of preserving its kind, which is owing to the fact that each cell by hereditary division gives rise to innumerable generations of cells which are carriers of the peculiar characters of the race or of the 'heredity mass.' These cells or units take specific forms which at every stage show the influence of, and are modified by, countless external factors as well as by the endless complications which the life units exert upon each other. The individual cells, although of the same species as being descendants of the same mother cell, yet develop under dissimilar conditions both in point of space and of time. The full exposition of Professor Hertwig's theory requires more space than is at our disposal, but our readers will be able to gather from the above the general tenour of his work.

Elements of Pharmacy, Materia Medica and Therapeutics. By WILLIAM WHITLA, M.A., M.D. Seventh edition. London: Henry Renshaw. 1898. Price 10*s.* 6*d.*

THE issue of a seventh edition of Dr. Whitla's well-known work is itself strong evidence of its popularity, and the present volume, which is brought well up to date, will be found a useful addition to the library of all students and practitioners. The book is divided into five parts. The first part is devoted to the subject of pharmacy, and full directions are given concerning the compounding and dispensing of drugs. There are numerous woodcuts which illustrate many practical points, and the "general hints to the dispenser" at the end of the section will be found equally useful to the prescriber.

The administration of medicines is dealt with in the second part and the subjects of variations of doses, incompatibles, and prescription writing, are all carefully considered and fully explained. In connexion with the last-named subject there is a very useful table which gives all the Latin words which are ever likely to be met with in prescribing.

Materia medica occupies the third part, and here the arrangements and classifications of the different preparations in tabular forms will be very serviceable to students for examination purposes; there is also a description of all the official remedies arranged in alphabetical order. The important subject of therapeutics is considered in the fourth part, and here again the drugs are arranged alphabetically. Clear and concise accounts of their actions are given and examples of typical prescriptions are freely interspersed.

The fifth part is given up to non-official drugs and a judicious selection of the principal ones in use together with their therapeutical actions will be found.

A valuable index of the poisons and their antidotes, lists of the additions and omissions of the British Pharmacopœia for 1898, and full tables of the weights and measures together with the relations between English and metric weights will also be found. It will thus be seen that the different branches of the subject are all fully dealt with in a useful and practical manner and the book is one which can be confidently recommended to both practitioners and students.

Renal Growths, their Pathology, Diagnosis and Treatment. By T. N. KELYNACK, M.D. Vict., M.R.C.P. Lond., Pathologist to the Manchester Royal Infirmary; Demonstrator and Assistant Lecturer in Pathology at the Owens College, Manchester. Edinburgh and London: Young J. Pentland. 1898. Pp. 289. Price 12*s.* 6*d.*

IT is a very fortunate thing for teachers and workers in science that able men are from time to time inspired to write monographs. It is mostly a labour of love, and though the financial profit may not be large the credit is considerable when the result is as successful as in the present case. The subject of renal growths, which Dr. Kelynack has chosen for a monograph, is a difficult but highly interesting one. No one in this country has hitherto attacked it and Dr. Kelynack has done so in such a thorough manner that he has filled a gap in medical literature for some time to come.

In an introductory chapter the author points out the vague nomenclature formerly in use with regard to renal neoplasms—rendering the records of the past almost valueless for purposes of scientific study. Accurate histological data have only begun to accumulate within the last few years, the term cancer having been loosely employed for any sort of malignant growth of the kidney. The classification which Dr. Kelynack prefers is that of Newman, which differs from that of most writers on the subject in disregarding the question of congenital or acquired origin and taking histological structure alone into consideration, and this is certainly a logical position, since there is no hard and fast line between the renal tumours of infancy and of adult life. Numerous figures are given illustrating the frequency of primary and secondary growths of the kidney, but the number of cases with an accurate histological record is not sufficient for any satisfactory conclusion as to the relative frequency of the different types of neoplasm. Secondary growths appear to occur in the kidney in some 8 per cent. of all cases of carcinoma and in 14½ per cent. of all cases

of sarcoma. In the matter of etiology Dr. Kelynack is unfortunately not in a position to shed much fresh light on the subject. Embryonic inclusions of different kinds receive due consideration and a number of cases are recorded in which traumatism seems to have preceded the appearance of the growth. The author's own figures as to the influence of sex are in opposition to those of most authorities, as he finds a slight preponderance in females up to the age of forty years, and this seems to be due to the larger number of cases of sarcoma in early life in that sex. In an analysis of 160 cases of malignant renal growths of all kinds their excessive incidence in early childhood is well brought out, 52 per cent. occurring in patients under ten years old.

A chapter is devoted to the general characters of renal tumours; in some tables devoted to their weight the greater average mass of sarcomata, as compared with carcinomata, is well brought out as also is the greater average mass of cases in children compared with adults. Size, form, and consistency are also discussed. The surgical importance of the modes of extension of malignant renal growths leads to a special chapter devoted to this subject and several important points are brought out, amongst others the lateness and comparative infrequency of lymphatic involvement and the liability to spread along the veins. It is a well-known fact that renal tumours are often extremely difficult to diagnose microscopically and there is probably no organ in the body of which the neoplasms would better repay minute study than the kidney. Regret may be expressed with regard to the brevity of Dr. Kelynack's chapter on the Relationship of Renal Growths, and the absence of any definite conclusions on the subject. We can, however, fully endorse his remark that sections should be prepared from different parts of any doubtful growth, as the microscopic appearances may vary remarkably in the same neoplasm.

The benign growths of the kidney are naturally treated shortly on account of their relative rarity and slight practical importance. Fibroma, lipoma, and angioma are the principal forms described. An interesting case of fibrolipoma is quoted at length from Warthin and another of a very unusual case of vascular growth from Rolleston and Kanthack. Renal sarcoma is very fully considered, since it is perhaps the most important and in many respects the most interesting class of renal growths. The author deals with them from three points of view—according to the age at which they develop, the situation in which they arise, and their histological character. A summary of all the known facts is well presented, though nothing of any striking novelty is to be found. The complex histological character of many of the renal sarcomata is very rightly insisted on and cases of myosarcoma and adenosarcoma are related. Next follows an account of the adenomata, simple and malignant; the writer lays stress on the occasionally malignant character of certain growths which from their microscopic characters alone might be pronounced innocent. A full account of a case of "malignant papilliferous cyst-adenoma" is given, with clear and careful drawings, and other cases are related for comparison. The very important question of the relation of renal growths to adrenal structures is the subject of a special chapter. The inclusion of adrenal "rests" not only in the kidney but elsewhere is a well-established fact and there are numerous examples of renal growths which seem clearly to have this origin. The best authenticated of these are described by Dr. Kelynack in considerable detail and he is able to add cases under his own care. True carcinoma of the kidney is dealt with in a comparatively short chapter, a circumstance due mainly to our ignorance of these growths. Not only is there no hard and fast line between adenoma and carcinoma, but the truly epithelial growths of this organ are often very difficult to distinguish from those of connective tissue origin. Nevertheless, true cancers are not very rare and Dr. Kelynack is able to quote examples of their most important varieties.

The relation of renal to adrenal tumours is so close that the author very properly devotes a chapter to the growths arising in the latter organs. Of the benign growths adenoma is the only one of any importance and numerous illustrations of this condition are given. Various malignant tumours are also described, including a full account of a case of primary adrenal sarcoma by Affleck and Leith. Finally, a short account of perirenal growths ends the pathological part of the volume and deals mainly with perirenal lipomata.

It is sufficiently evident that Dr. Kelynack is a pathologist, for after 191 pages of pathology we find symptoms, diagnosis, and treatment disposed of in less than 40 pages. Not, indeed, so much because he omits anything, for we can find no matters of importance left on one side, as because this part of the subject seems to appeal to him less and he only rarely introduces illustrative cases in any detail. We note with pleasure that the old doctrine that renal tumours do not move with respiration receives very qualified acceptance at the writer's hands; small degrees of movement, at least, are common. The differential diagnosis of renal growths from other tumours with which they might be confounded is discussed with sufficient fulness. In treatment the all-important question is whether removal is justifiable or not. The history of the operation is given and its mortality from various published tables carefully considered. Dr. Kelynack does not take by any means so pessimistic a view as to surgical interference as is usually met with. He believes that the present mortality (some 50 per cent.) might be largely reduced if the operation were undertaken at an earlier stage than is commonly the case. A long and useful bibliography of thirty pages and a good general index bring the work to a conclusion.

Dr. Kelynack may be congratulated upon the care and thoroughness with which he has brought together and rendered conveniently accessible such a large mass of information upon an important and interesting but difficult subject. The only important matter to which we can take exception is that the book is too largely a collection of the observations and opinions of others and too little a judicial criticism of those opinions by the writer himself. This, however, is a small matter compared with the great service which Dr. Kelynack has rendered in writing the monograph. The illustrations are numerous and often admirable. Mechanical reproductions of photographs are largely employed, but they are not invariably successful in giving a good idea of the naked-eye characters of a renal growth since the colour element is wholly lacking—indeed, some of the most instructive illustrations in the book are from drawings and not from photographs.

ROYAL AQUARIUM, WESTMINSTER.—At the Royal Aquarium there is now on exhibition a family consisting of Clara, Tom, and Anna Snell, three of a family of fourteen. They were born at the Bunyip, Gippsland, Victoria, their father and mother being natives of Devonshire and showing nothing of the extraordinary peculiarities of their children. The rest of the members of the family are of normal size. At the age of twelve years Clara, the eldest, weighed 17 st. 4 lb., with a waist of 66 in., calves 23 in., and arms 19 in. Tom at the age of eight years weighed nearly 9 st. and Anna turned the scale at 8 st. 4 lb. Clara is now twenty-four years old, weighs nearly 36 st. and measures 78 in. round the waist, 26 in. round the leg, and 22 in. round the arm. Tom, aged twenty years, weighs 19 st. and measures 48 in. round the chest, the rest of the body being very well developed, and Anna, the youngest, turns the scale at 24 st. and is large in proportion, their united weight totalling nearly half a ton.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 17, 1898.

RICH in moral as in material products Italy seems bent on creating a monopoly in that most sinister creature—the political assassin. Her soil is traditionally well fitted for his cultivation. Given the southern blood, quick to feel and quick to resent; given the all too amply justified contempt for the law as a means of protection and reparation; given the much-abused resource of the confessional, which whitewashes crime and rehabilitates the criminal on easy terms; given the sonorous rhetoric of the Revolution with its impassioned appeals only too effective with an impressionable proletariat, to the examples of HARMODIUS and ARISTOGEITON, of TIMOLEON and BRUTUS, of BALILLA and PALAFOX; given finally the hardness of living which makes incarceration welcome and meets death more than half way, and we have a total of conditions which goes far to explain the fact that, "excluding Spain and Portugal, Continental Europe is outdone in her annual number of homicides by Italy alone," and that Italian soil is rapidly becoming the appropriate recruiting-ground whence the political assassin springs — whence he is almost invariably drawn to subserve the purposes of aggressive Socialism and to promote the Reign of Terror which the anarchist avowedly seeks to impose.

For this characteristically Italian "product" has now become an Italian "export"—freighted from Italy in unusually increasing numbers, represented in the gangs of cheap labour which the hardness of living within her borders throws year by year upon frontier States and even further afield, until there is hardly a European centre which has not its "Italian quarter," lost to its own and not affiliated to its adopted country and only too prolific of desperadoes, the willing tools of the "social vendetta." Leaving out the attempt in Rome during the race week of last year on the life of King HUMBERT, the three murders within a few months of each other of the French President CARNOT, of the Spanish Premier CANOVAS, and now of the Empress of AUSTRIA have each been the work of an Italian, each perpetrated with a cynical audacity bearing a perfect family likeness, and each gloried in by its author as, though possibly useless in itself, still done "*pour encourager les autres*" and preparing for the "socialist advent" and for the "anarchical paradise."

The political assassin is indeed an Italian "export," and Italy must not be surprised if the civilised world applies to it the most stringent prohibitive "duty" if only in self-defence and the common interests of mankind. Already the European press is recommending as strict a frontier surveillance over the immigrant Italians as is already enforced against the unauthorised importation of dynamite or any other death-dealing explosive, and it justifies this policy on the ground that it is humaner and less likely to irritate than the hounding to death of Italian residents or the sacking of Italian shops which was practised on French soil after CASERIO'S murder of CARNOT. Even without such preventive policy it is likely enough that Continental employers of labour will shrink from recruiting their industrial hands from Italy and thereby introducing into their respective communities an element so prompt to make itself the tool of a conspiracy aimed avowedly at all wealth amassed through the toil of others. But be all this as it may, the lesson must be borne in upon Italy herself that it is with her and her alone that the responsibility lies of sinister "product" and sinister "export" alike and that only by her ceasing to create the former can she hope to escape the consequences which she incurs from the latter. Her whole system—governmental and administrative—requires root and branch reform and she has not a day to lose in beginning the work of rehabilitation. She has representative institutions: let her see that they are properly utilised. She has what practically amounts to manhood suffrage: let her show, or, at least, try to develop, that "sense of citizenship" which on election day brings the voter to the urn, and the want of which, even in the gravest political crises, causes her to poll but half her strength. She has an army and navy far beyond her needs, certainly far beyond her power to maintain at a decent standard of efficiency: let her reduce both to the dimensions required by prudence and the claims of more vital interests. Above all, let her wipe away the reproach cast upon her by her own sons, "che in 38 anni di governo nazionale l'Italia abbia fatto nulla, propriamente nulla, per l'educazione delle classi lavoratrici" (that in 38 years of national government Italy has done nothing, literally nothing, for the education of the working classes). Here, indeed, lies the inner plague spot of her political system—the impoverishment of her elementary and secondary schools to meet the expenses of establishments which devour her substance and drive her robuster hands to seek a livelihood in other climes. Out of a population of (in round numbers) 30,000,000 about one-half are *analfabeti* (unlettered), and this too when, thanks to her thirty universities, her professions are enormously over-manned, 500 *avvocati* (barristers) thrown upon the public every year in excess of any possible occupation for them, and medical men "duly qualified" in similar disproportion after a four-years' graduation course which costs only three hundred francs (£12)! By none is this "waste" or malversation of intellectual and moral force more deeply deplored than by the heads of the professional classes themselves, condemned as they are to see the unemployed *avvocato* or *sanitario*, whom nature intended for industry or commerce, seeking in political agitation or revolutionary journalism the maintenance his all too easily acquired degree denies him. "Heal thyself," is Italy's watchword, and she may rest assured that in the Europe (justly indignant at her unique reinforcement of anarchical crime) which is now striving to protect itself against the assassins whom she exports she will find a sympathetic

well-wisher and auxiliary if only she will be true to her illustrious traditions and rehabilitate herself on nobler lines.

THE exceptionally dry and bright weather which has been experienced in this country during the summer months, culminating in the heat waves which have not yet ceased to beat upon us, has brought with it both benefits and ills. Of the latter the scarcity of water in many rural districts and in the most densely populated sections of the metropolis has been perhaps the most prominent. Happily, it has not as yet been accompanied by any notable increase in sickness, whilst as if to compensate for the drought the farmer has had no reason to complain of the character of the harvest. Setting aside the important question of water-supply, which is dealt with in another column, it may well be asked whether a hot season does not conduce more to health than to illness provided that due provision is made by those subjected to it to accommodate themselves to the change in temperature. For with heat comes the excess of sunshine which, as we all know, is one of the best of Nature's remedies. A summer like that which we have just gone through has enabled thousands to live practically in the open air and to gain fresh vigour of mind and body by the mere subjection to the influence of light, assisted by the breezes from the sea or the pure air of the mountain-top. Many, we doubt not, have prolonged their holiday in some health-giving spot, taking full advantage of the continuance of sunshine, and in this they have acted wisely by adding still more to their stores of health.

All, however, are not so happily circumstanced, and the vast majority of our town-dwellers are those who have had perforce to remain chained to the mill and to pursue their daily task under conditions which are, to say the least, irksome. Yet even to them life under exposure to well-nigh tropical conditions would have been endurable had they only been able to change their habits with their environment and temporarily to transfer to the temperate regions the manners and customs of the denizen of the tropics. Few, however, can do this—many because of the lack of enterprise or of the dread of making any change in routine. It is partly, if not mainly, in consequence of this inability to adaptation to circumstances that every "heat wave" is sure to be marked by cases of sickness directly due to the heat itself. Nor are such cases all of the category of heat-stroke or heat-apoplexy of which there have been not a few during the past weeks. Sometimes the influence of heat has been exerted on the brain in such a way as to produce definite functional derangement and undoubted insanity. It would seem, indeed, as if the higher cerebral functions are especially prone to be affected by extremes of temperature. We imply this when we say that cold benumbs and heat exhausts the faculties. Intellectual labour of any kind is toilsome under extreme climatic conditions, and much of the differences in racial characteristics, both physical and mental, may be explained by the nature of the climate under which life is carried on. That there is evidence of the direct action of external heat upon the production of insanity is manifest from the comparative frequency of a history of previous sunstroke amongst the insane in contrast with the prevalence of sunstroke in the community at large. No doubt the "sunstroke" is only one factor towards the ultimate result, but it is equally certain that often everyone of the antecedents may co-exist without the sequel of insanity. Yet it is probable that many of those who do become insane after experiencing a sunstroke have become so in consequence of some pre-existing mental instability.

But does this explanation hold in such cases where the mental derangement follows immediately upon the heat-stroke? Of this there have been several cases recorded during the past few weeks—cases of acute mania, of melancholia, of suicide—of which no other explanation has been forthcoming. The scientific investigation of such cases has yet to be made, but the fact remains that exposure to unaccustomed heat may upset the nervous balance so that what to one is merely a sense of exhaustion or an irritability of temper is to another pronounced insanity. Curiously enough, it is not amongst those whose nervous organisations are the most finely balanced that these graver effects are most often shown, so that it is clear the subject requires far more attention than has hitherto been bestowed upon it. It comes to this, that in a temperate climate like ours the subjection for even a few days to a temperature of 90°F. in the shade is trying to all and dangerous to some. It might be better borne and its dangers minimised were it possible for the community to change their habits and their clothing concomitantly with the rising thermometer. But duties have to be performed, the imperious behests of fashion have to be obeyed, the daily routine of work has to be gone through, and the staple articles of food consumed in order that the machinery of our civilisation shall continue to do its work without fail. Hence it happens that more victims have to be sacrificed to the sun-god than he would be able to claim were more rational modes of living in vogue. Still, in spite of all there are few who do not gladly suffer the inconveniences and discomforts of a temporary tropical existence under conditions adapted to the temperate zone in return for the gain to health which must accrue from a high average of the number of hours of sunshine.

WHILST the physics of the senses of sight and hearing have attracted the attention of many philosophers and have been elucidated by numerous ingeniously contrived experiments those of taste and smell have been comparatively neglected. The very phraseology by which we are accustomed to describe the impressions which we receive through these portals of sense is indefinite, obscure, and uncertain. There are, indeed, several terms which would call up corresponding sensations in regard to the sense of taste, such as sweet, acid, alkaline, oily and mawkish, but our vocabulary is small in calling up sensations of smell and is almost limited to such general terms as pleasant and unpleasant, pungent and aromatic, fœtid and fresh, which have none of the definiteness or precision that the terms blue or green possess in ordinary conversation or that the expression treble G gives to the musician. Our memory of odours is in general very imperfect. Attempts have been

made, but not very successfully, to establish a gamut of odours, and it is difficult in many instances to dissociate the senses of smell and taste. CUVIER observed that these two senses are nearly allied to common sensation. In those animals which are only capable of breathing through the nose, like the horse, the extent of surface ministering to the sense of smell is immense as compared with that of man. A large area of the nasal cavities is covered with mucous membrane which is thick in both, studded with numerous acinous glands, covered with stratified ciliated epithelium, supplied by the fifth pair of nerves, and is probably dedicated to other functions than those of smell, as for example, the warming and moistening of the air,' and its purification from dust before entry into the lungs, and a large portion also of the upper region seems merely to act as a periosteum to the frontal and ethmoidal cells, and to possess but a small share of special sensibility. The turbinal bone, on the other hand, the volutes of the ethmoid, and a considerable area of the septum between the nostrils, is covered with a thin yellowish-red membrane, the epithelium of which is unprovided with cilia, to which the branches of the olfactory nerves are distributed, the ultimate fibrils being traceable to the very surface, covered only by a thin layer of fluid and being well placed therefore for the perception of delicate impressions. Common observation shows that whilst man is capable of perceiving a great variety of odours many animals surpass him in the acuteness of their perceptions. The nature of these emanations probably varies considerably. Water, which has no smell to man, can be perceived by some animals at considerable distances. Sexual odours appear to be peculiarly expansive. SCARPA found that if he plunged his hand into water after handling a female toad the males were attracted to him. Insects, and especially those of nocturnal habits, are guided to each other by their emanations. Judging from the actions of animals, the odours of plants are only in rare instances, as in the case of valerian by the cat, perceived or at least enjoyed by the carnivora. Putrid meat is devoured by the vulture and jackal though it is not touched by many flesh-eating animals that feed on living prey, whilst it produces a kind of convulsion in many horses and madness in the bull.

The physics of smell was made the subject of an address delivered to the British Association at Bristol by Professor W. E. AYRTON, F.R.S., who has devoted much time to the subject and has performed some original experiments. The points to which Professor AYRTON especially directed his inquiries were the smell of metals, the rapidity with which odours diffuse, and the capability of odours to traverse thin films of glass. In regard to the first point it seems that contrary to what might be expected a large number of the metals, as aluminium, copper, silver, gold, iron, steel, tin, and zinc, and of the alloys brass, bronze, German silver, and phosphor-bronze, have no smell, providing they are carefully cleaned, nor is any smell perceptible when they are rubbed over with dilute nitric acid, vinegar, ammonia, soda, or a solution of sugar, except the odour of these several substances. Breathing on brass, copper, iron, steel, or zinc, which has been rendered practically odourless by cleaning produces a very distinct smell which Professor AYRTON is inclined to believe is due, when iron or steel is handled, to the hydrocarbons developed by this operation and not to the detachment of particles of the metal.

In regard to the diffusion of odours it would at first sight appear that odours diffuse with great rapidity. If the females of certain moths be exposed in an open space enclosed in a muslin bag the males will soon be seen to congregate around them. Deer, dogs, and other animals, will recognise their enemies or their prey at considerable distances, but Professor AYRTON, although beginning his experiments with this preconceived idea, and using at first tubes 15 ft. or 20 ft. long, soon found that if draughts were carefully avoided odours diffused with extreme slowness and that tubes of a few inches in length were quite sufficient to enable him to determine the rate of diffusion, from which the conclusion may be drawn that under ordinary circumstances the movement of the air is the principal agent in the diffusion of odours. The long retention of certain odours by glass vessels led Professor AYRTON to try whether an actual transpiration through glass could be detected by the nose, and for this purpose various scents were enclosed in extremely thin glass globes, but the results were negative. The subject which Professor AYRTON brought before the British Association is one of considerable interest, and he deserves the thanks of biologists for suggesting a fresh line of inquiry.

JUST a year ago there began the epidemic at Maidstone in which, during four months, 1818 persons out of a population of about 34,000 were attacked by typhoid fever and some 130 deaths ensued. It will be remembered that the Local Government Board hit upon a novel, and we hardly think a satisfactory, method of investigating this outbreak by means of a formal public inquiry held after the epidemic was over. With the enviable leisureliness which characterises the appearance of official publications they have now issued the report of the three inspectors to whom this inquiry was entrusted. From this report, which we notice in another column, we find that the conclusions drawn by the inspectors are in general accord with the views which at the time of the outbreak were formulated by Mr. M. A. ADAMS, the medical officer of health of Maidstone, as well as with the facts set out in the series of articles by our Special Commissioner published in THE LANCET last October.

The epidemic, say the inspectors, "was caused by the pollution of the water supplied by the Maidstone Company from their Farleigh sources." To a material, but nevertheless to a wholly subsidiary extent, the epidemic once set going was maintained by a multiplicity of insanitary conditions in the town itself—defective drainage, accumulations of excreta in water-closets without means of flushing, and the like. The evidence which connected this outbreak with water was irresistible. The map of Maidstone could be divided into three areas of peculiar shape, each having an independent water-supply obtained respectively from the springs of Cossington, Boarley, and Farleigh. During the first six weeks of the outbreak

some 1560 persons in the borough were attacked. If anyone unacquainted with the conditions of the Maidstone water service had set himself to mark on a map the streets in which these people lived he would have produced an almost complete plan of the distribution of the Farleigh service. This peculiar incidence, by far the most important factor in the etiology of the outbreak, was, apart from water, incapable of adequate explanation. It is true that the water company were fortunate in having in Professor CORFIELD a high authority for asserting that notwithstanding the distribution of the cases faulty sewers and house drains might have been sufficient to cause the epidemic. But the suddenness of the outbreak; facts such as the heavy incidence of fever in Barming Asylum, with drains practically without defects, but supplied with water from Farleigh; the special selection by the fever of those (unsewered) parts of the rural district which received Farleigh water, as well as many other matters which the inspectors record, all suffice to show that a theory of infection by sewer emanations could not account for the principal phenomena of the epidemic. In the matter of bacteriological evidence, again, the water company were able to claim some divergence of expert opinion. But the circumstance that Dr. SIMS WOODHEAD, the bacteriologist called in by the company, failed to find bacterial evidence of fæcal pollution in any part of the Farleigh supply loses most of its significance when we learn that all the samples which he examined were collected nine weeks or more after the outburst in the middle of September. And, on the other hand, while the epidemic was at its height, Dr. J. W. WASHBOURN had found unmistakeable bacterial evidence of pollution in certain of the springs, while as late as Oct. 19th Dr. H. E. DURHAM found the bacillus coli in samples which he examined. Moreover, in the circumstances the question whether antecedently to the outbreak there had been dangerous pollution of Farleigh supplies was not one which needed to be decided upon bacteriological evidence. On this point the history of the source of the Farleigh springs, together with the evidence of trustworthy eye-witnesses, which "showed clearly that the neighbourhood of some of the springs was immediately before the outbreak plentifully covered with human excrement," was of itself conclusive. By whose means and at what point or points the specific infection was introduced, the inspectors have, however, been unable to pronounce.

The experience which Maidstone has so dearly bought has, we may hope, already brought some share of good as well as of evil. Throughout the kingdom it has compelled attention to the inadequacy of control which both central and local public health authorities have over water companies and to the pressing need that a proper control should be exercised. For the present state of things Parliament has been largely to blame and Ministers will take heavy responsibility if they delay to find adequate remedy. The outbreak has brought home, as nothing but a big calamity can, the necessity of constant vigilance on the part of all purveyors of water, whether they be local authorities or companies, to safeguard the purity of their supplies. No water authority should rest content with the knowledge that its waterworks are well designed and that at the time of their establishment they furnished water of demonstrated purity. The question must constantly be asked whether adequate steps are being taken to keep this water day by day up to its proper standard of wholesomeness. Only in very exceptional cases can a water authority safely dispense with frequent and systematic skilled inspection of their gathering-ground together with bacteriological and chemical examination, also frequent and systematic, of each contributory source of supply. It is to be feared that in the case of too many of our public water-supplies such inspections and examinations are carried out in a perfunctory fashion, while there are still other supplies in which—notwithstanding the experience of Maidstone—no attempt is made to take these necessary precautions.

Annotations.

"Ne quid nimis."

THE LATE EMPRESS OF AUSTRIA.

IT would be hard to conceive a more impressive spectacle than that which confronts Europe and the civilised world at the present time in the person of the nobly pathetic figure of the Emperor of Austria crowned with sorrows superimposed one upon the other. Upon few princes, indeed, has the irony of fate borne so hardly as upon this dignified and benevolent Emperor. It is a pitiful history, turn which way we will. He succeeded to a kingdom shaken by civil war, but by force of character, combined with just and conciliatory rule, he has lived to convert his once bitter and traditional enemies into his warmest friends and admirers. In no part of his composite empire is Francis Joseph so beloved as in Hungary. He has seen the kingdom it was his unhappy fortune to inherit torn and mutilated at Magenta by the victorious armies of France and Sardinia and on the plains of Bohemia by the Prussians at Königgrätz. Turning to the private and domestic side of his character it is benevolent and blameless. The life of the Emperor, who is universally recognised as a good and virtuous man, with a conscience void of offence to everyone, has been full of tragedy—sorrow succeeding sorrow and disappointment following disappointment. But, like the hero he is, he has borne himself throughout with real dignity. He has never allowed his misfortunes to embitter him or render him cynical; on the contrary, they have widened his sympathy with suffering and enlarged his charity. And yet, to quote his pathetic exclamation on hearing the terrible news of his wife's assassination, it seems as if no sorrow in this world is to be spared him. It must be remembered that his marriage with the Empress was a love match; that the Emperor was passionately in love with the young, beautiful and romantic girl who has throughout been his affectionate support for forty-four years and who was an altogether charming, brave and accomplished woman of whom any prince might have been proud. Well might the bereaved Emperor say that it passed his comprehension how a man could lift a finger against his wife who certainly never injured anyone in her life. The womanly graces, the charities, the pitifulness and heroism making up the Empress's life and character were well known. It is, indeed, a lamentable illustration of the irony of fate that at the very time when his subjects are preparing to celebrate the Emperor's jubilee this calamity should have fallen upon him. The Emperor's devotion to his sense of duty has hitherto carried him through all his trials and those

who know him best feel assured that it will not desert him now in the hour of his present affliction but that he will maintain the same fortitude he has always displayed. It is some solace to feel that the death of the unfortunate Empress was so comparatively painless that Her Majesty evidently did not realise the injury she had received and that it was so speedily followed by unconsciousness. Of one thing the Emperor must feel assured—namely, that all his subjects share his sorrow and that he has not only their heartfelt condolence, sympathy and respect, but those also of every right-thinking man and woman outside the confines of his empire. As regards the perpetrators of such crimes they are simply outside the pale of humanity and they require to be treated with exactly the same consideration that we should extend to dangerous wild beasts or venomous reptiles, and some concerted international action is required to deal with these cruel pests. The post-mortem examination showed that the heart had been completely penetrated; and some surprise has been felt that so grave an injury to a vital organ can be inflicted without causing immediate death. But unless the cardiac ganglia are directly involved such an event seldom happens, provided that, as in this case, the wound of the heart wall is small, for in medical literature there will be found records of survival of considerable duration with retention of power such as in this case enabled the Empress to walk to the steamer and to be herself unconscious of the gravity of the lethal blow. We publish elsewhere the details of a case of wound of the heart which was successfully sutured eight hours after the injury had been inflicted.

THE LABELLING OF POISONS.

AN INQUEST of considerable importance to medical men and druggists was held by Mr. Cox, coroner for the Exmouth district, on August 15th. The coroner made use of strong expressions, as will be seen below, but it is a matter of regret that he had not first consulted the Pharmacy Acts, when he would have seen that whatever his private feelings may have been he was quite wrong in his law. The inquest was on the body of a child, aged three years, who drank some of the contents of a bottle of eye wash which had been left on a chest of drawers. The wash had been obtained from a druggist (Mr. Bickford) through the dispensary according to a prescription given by Mr. Martyn. The mother had been using the eye wash for some months, but had not been told whether it was dangerous or not. The coroner said that the bottle had a red label bearing the words, "Not to be taken," and another label with the following: "Exmouth Dispensary. The drops to be used three times a day. Lily Bastin. J. T. Bickford, dispenser by appointment, Strand Pharmacy, Exmouth." The lotion was made up from cocaine, atropine, and water. The child when seen by Dr. J. W. Hodgson shortly after swallowing the lotion was suffering from the symptoms of atropine poisoning and died the following day. It is not with these symptoms that we are concerned, however, but with the following conversation as reported in a local paper (*Devon Gazette*, August 16th). Mr. J. T. Bickford stated that he supplied the preparation in the bottle produced. "The Coroner: Are you aware what the ingredients are? Yes.—Are you aware that some of them are poisons and that they are incorporated by the Pharmacy Act in Schedule A as such? Yes.—Are you further aware that it is your business to be aware that any preparation of atropine has to be labelled 'Poison'? No; I am not aware of that with respect to a medical practitioner's prescription. I am aware that if it is sold over the counter it is required to be labelled.—The Coroner: This bottle ought by law—and you have broken the law—to have been labelled 'Poison,' and it is for the protection of the public that that law was made. Did you label it? Yes.—Then you've broken the law and it is a very serious matter for you; you have neglected your duty and this child has died. The regulations laid down in this Act are made for the protection of the public and it is my duty to see that they are carried out.—Witness: Will you read the Act, please? The Coroner: Yes, most certainly.—That part of the Act relating to the subject was read and Mr. Bickford contended that he had complied with the provisions.—The Coroner: I don't know what view the jury will take of this case, but you lay yourself open to a charge of manslaughter and I leave it with them as to the verdict. They can return a verdict of manslaughter if they think it a case of sufficient neglect." Assuming the above to be a correct report of what took place such remarks falling from the lips of an officer of the law are very serious. Turning to the Act we find in Section 17 the following words: "It shall be unlawful to sell any poison, either by wholesale or by retail, unless the box, bottle, vessel, wrapper, or cover in which such poison is contained be distinctly labelled with the name of the article and the word poison, and with the name and address of the seller of the poison." Certain exceptions are then made, such as in the case of a "legally qualified apothecary." We presume it was the above extract which was read in the open court. It would have been better, however, for everybody concerned if the following had also been read: "An Act to amend the Pharmacy Act, 1868, 32 and 33 Vict., cap. 117," "3. Nothing contained in section 17 of the said recited Act shall apply to any medicine supplied by a legally qualified medical practitioner to his patient or dispensed by any person registered under the said Act, provided such medicine be distinctly labelled with the name and address of the seller, and the ingredients thereof be entered with the name of the person to whom it is sold or delivered in a book to be kept by the seller for that purpose." As nothing is reported to the contrary, we may presume that Mr. Bickford followed the usual custom of copying the prescription before sending out the bottle; consequently, by placing the label "Not to be taken" on the bottle, Mr. Bickford took more precautions than the law required and certainly did not merit the reproof administered by the coroner. We hear that the latter has offered an apology for his error. We trust that such is the case and that the withdrawal of the censure will be as widely made known as the report of the inquest. We cannot leave the subject without drawing attention to the verdict of the jury: 'The jury, after a short deliberation, returned a verdict of 'Accidental death,' adding a rider that the cause of death was due to the child drinking part of the poisonous contents of a bottle of eye wash." The foreman (Mr. J. Dyer) also said it was the unanimous wish of the jury that he should say that all druggists in Exmouth, when supplying any of the poisons or preparations in which they were contained mentioned in the Act should label the bottle "Poison." The Coroner (addressing Mr. Bickford): "You have heard the expression of the jury. I entirely agree with it and I hope you will adhere strictly to what has been said and that you will label all dangerous bottles 'Poison.'" A juryman: "I don't hink that it is the opinion of the whole jury. It is not mine. I think it is only the foreman's."

DR. NEUFELD.

IT is perhaps not generally known that Dr. Neufeld, who has just been delivered from captivity in Omdurman by the Sirdar's army, is a medical man. *The Times* of September 13th, quotes the following account of his career on the authority of the *Vossische Zeitung*:—

"Karl Neufeld studied medicine at Leipsic University and went early in life to Egypt, following first his profession as a medical man and subsequently as a merchant. At the

beginning of the eighties he had a practice at Keneh, Upper Egypt, where several Germans and also natives of his own home saw him. Subsequently he set up as a merchant at Assouan. After the fall of Khartoum and the firm establishment of the Mahdi's power at Omdurman Neufeld seems to have formed a scheme for opening up commercial intercourse with the closed Soudan, for he equipped a caravan with which he proceeded to Berber, which was then in the hands of Osman Digna. The latter sent the German, whom he looked upon as a dangerous spy, to the Khalifa Abdullahi. This was in 1886. Neufeld was condemned to death and was taken to the place of execution. He behaved there so courageously, asking to be executed like a Mahomedan (instead of suffering death by hanging), that the Khalifa was struck and respited him under the gallows. He was taken to the general prison, with heavy chains on his hands and feet, and treated altogether in a most abominable manner. He was kept alive by the women, who took pity on him and fed him, as they had done before him to Slatin. Then an endeavour was made to utilise his knowledge. He knew nothing about founding cannon, but he managed to manufacture powder, and he was also ordered to invent a machine for coining money. Owing to the escape of Father Ohrwalder and, later, of Slatin Pasha, his position became worse. He was again manacled and threatened with having his arms and feet hacked off if he should attempt to escape. There were many efforts to liberate him. The Austrian Catholic Mission, induced by Father Ohrwalder, Slatin Pasha, the British Government, the German, and more especially the Austrian, representatives at Cairo, all endeavoured to further the escape of Neufeld. He frequently received money, but he refused to escape as he would not accept liberty without his wife—an Abyssinian slave presented to him by the Khalifa—and the two children whom she had borne him. The latter would have been exposed to fearful tortures, and thus Neufeld chose to remain a prisoner. He was active subsequently also as an artist, and as he could draw well he was ordered to decorate the mausoleum of the Mahdi, and this pleased the women of the Khalifa so much that they petitioned the latter for his liberation. It is also said that he has written Arabic books and illustrated them. The latter part of his twelve years' detention appears to have been less onerous, as after the escape of Slatin he had to be interpreter to the Khalifa and translator of European newspapers which the ruler of the Soudan received regularly. It is to the credit of the Khalifa Abdullahi that not one of the Christian prisoners received a hurt on the approach of the Anglo-Egyptian forces. It is expected that a narrative of his experiences in the Soudan will be shortly published by Dr. Neufeld."

THE DERBY CORONER AND THE MEDICAL ASSOCIATION OFFICER.

AT an adjourned inquest on the death of William Marshall, aged fifty-one years, a laundry porter of Derby, held by the borough coroner, Mr. John Close, some interesting points were raised, though they were unfortunately obscured by the altercations between the coroner and Mr. A. B. Carey Orchard, L.R.C.P. & S. Edin., one of three medical officers of the Derby Friendly Societies' Medical Association. The facts of the case were very simple and were admitted by Mr. Orchard. They were to this effect: Marshall was found dead in bed on August 19th. He was a member of the Medical Association and had used a prescription written by Mr. Orchard—which was put in evidence—at various times between May 14th and July 2nd. On the prescription he was entitled to three bottles of medicine. When the death occurred Mr. Orchard was away and declined to give a certificate. An inquest was necessitated by this refusal. But the warmth of the altercation began over it and by the other facts candidly admitted and confidently defended by Mr. Orchard. The principal other fact was that Mr. Orchard, the author of the prescription, had no remembrance of having ever seen the patient and thought it quite likely that he had not seen him. He said that on that very day he had done the same thing five or six times. He explained that working men were unwilling to leave their work and often sent a relative to describe the symptoms and get medicine for them. The prescription in question had been written apparently for a supposed slight torpidity of the liver. Another practitioner, Dr. Laurie, testified that his *locum tenent* had seen the deceased and had said that the death was due to heart disease. The report does not show why this gentleman did not give the certificate. Delay of burial and an inquest resulted, at any rate, from Mr. Orchard's refusal to give one. Up to this time our readers will not quite see how any warmth of discussion could arise between two learned gentlemen—Mr. Orchard and the coroner. But it did. The rise of temperature began by Mr. Orchard's saying that the coroner had once abused him for giving a certificate for a patient whom he had attended for eight weeks. It rose as the coroner described the system of the association as one which would allow a patient to be prescribed for for six weeks without being seen by a medical officer, and it culminated when the coroner refused to withdraw an expression of his opinion that the case was "an abominable one," and Mr. Orchard said that he (the coroner) was not a gentleman. He had to withdraw the statement, the coroner having ordered a warrant for commitment to be sent for. It is to be regretted that the facts could not have been temperately discussed, as they really are of interest to the public and all practitioners, and, as we have said, were really very simple. We entirely approve of Mr. Orchard's refusal to give a certificate for a case which he had probably never seen and certainly had not seen for six weeks. Nor can we say that it is absolutely wrong to prescribe for a patient without seeing him. In this work-a-day world it is sometimes inevitable in every class of society and especially in the case of working men. But still some facts of an unsatisfactory nature remain which it was worth an inquest to bring out. Here was a member of a friendly societies' medical association ill for three months and eventually dying without seeing one of its medical officers. We do not say or think that it was Mr. Orchard's fault, but may it not have been the fault of a system which throws on three men an impossible amount of work, and because the medical association system, as its critics say, is only another specimen of that kind of medical practice in which work is done wholesale for crowds and in which the individual patient suffers and perhaps dies? We are passing no partial judgment. The same is true of the out-patient system and even the old club system. And very impartial judgment is needed to correct the evil.

THE DANGERS OF THE "DRY-CLEANING PROCESS."

THE extreme care with which easily inflammable liquids should be handled was exemplified some time ago in the case of a paraffin hair-wash. This unfortunate occurrence, which resulted in the death of a lady from shock and burns, would appear to have been due to the ignition of benzine by the production by friction of an electric spark. It is well known that when the air is particularly dry the production of an electric spark, say by stroking the hair or by rubbing flannel, is a very simple matter. Under the very dry conditions of the atmosphere there is a strong tendency for opposite electrical conditions to exist on the slightest provocation. This probably accounts for a somewhat remarkable accident which occurred in a "dry-cleaning room" at Ashton. Some workmen were engaged in cleaning by the dry process certain garments, such as pants and vests. During the rinsing process a flash suddenly occurred in the "rinse kettle." "It was a bright flash like lightning. Then everything became one mass of flame, the spirit, garments, and everything." The fire extended and one man unfortunately lost

his life. The witnesses were one and all positive that the flame had its origin in the "rinse kettle" and every precaution was taken to exclude any possibility of ignition from naked flames or from lighted tobacco pipes. The igniting cause was probably, therefore, an electrical phenomenon and it only remains to suggest that when the weather is remarkably dry the air in dry-cleaning workshops should be kept moist by suitable means and extra care should be taken to avoid friction in the cleaning process.

A FLOATING HOSPITAL SHIP.

THE poor children of New York are during the summer months in a much more pitiable plight than those of London, or probably than those of any large town of the civilised world. The reasons for this state of things in New York are, firstly, because that section of it occupied by the lower classes and termed the tenement district is perhaps the most overcrowded of any plot of a like area in either the Old or New World. Here may be found massed together peoples of all nationalities—Italians, Germans, Russians, Danes, Swedes, Irish, and negroes—existing amidst inconceivably bad insanitary surroundings. The second reason is that there is, owing to the lack of space—New York being compressed within narrow limits by water on both sides—a great need of parks and playgrounds, and the third reason is that the heat during a portion of the summer is excessively stifling and oppressive. Until quite recent times too little has been done by public or private charity and nothing whatever by the municipal authorities towards bettering the conditions of life of the poorer classes in New York. It may be well understood that under these circumstances, while the lot of the adult members of the "submerged tenth" is hard to bear, the infants and young children suffer terribly; indeed, as might be expected, the infantile mortality is extremely high. One of the oldest of the New York charitable associations—St. John's Guild—resolved some twenty years ago to try the experiment of a floating hospital ship as a means of relieving and invigorating sick and weary infants, children, and their mothers during the hot months. Accordingly a boat suitable for the purpose was bought and in 1875 her first trip was made, since which time more than 800,000 children and their mothers have been carried on the Guild's great life preserver. The boat itself is a large barge about 300 ft. in length and having two decks. On the lower deck aft are two wards containing 15 cots and a bed in case some of the children should be too ill to sit outside. A medical man is carried aboard and attends to and gives medicine to any of the little ones needing his medical or surgical care. Forward on the lower deck are situated the commodious bath-rooms, supplied with hot and cold tub baths, shower baths, &c., under the supervision of a head nurse and three assistants. Bathing is made an especial feature of the hospital ship, and taking into consideration the woful lack of bathing facilities in the New York tenement houses the luxury of a good wash in hot water is fully appreciated by mothers both for themselves and their children. The remark, too, need hardly be made that as a sanitary measure and in certain affections the beneficial effects of a sea-water bath is of great value. The upper deck, which is covered in and well-sheltered from sun and wind, has ample sitting accommodation in the centre, but is unobstructed at the sides, thus providing a fine promenade. This upper deck is where the motley crowd of children and women spend their day inhaling the health-giving sea breezes and enjoying a short respite from their sordid existence in their crowded insanitary homes. The catering on the ship is on a generous scale, the infants and small children are given pasteurised or sterilised milk at frequent intervals, while those who are old enough to enjoy a good meal are provided with one in the middle of the day. The dining-room and kitchens are down below. The dining-room will accommodate 350 persons. The food consists of excellent meat stew and bread with milk as a beverage. The officers of the ship comprise superintendent, captain, physician, two matrons, and about twenty nurses and assistants. The total number of women carried in 1896 was 16,934, children 29,370. During the same season 1735 patients received actual treatment in the hospital. Of these 610 received special treatment in the two wards and 1125 on the decks of the hospital. These figures do not include the number of those patients who only received medical and sanitary instruction and advice. It should be mentioned that the ship makes six trips a week, starting at nine in the morning and returning at half-past five, she is able to accommodate comfortably 1600 patients, and in the hot weather is always quite full. Great care is taken by the physician, who examines everyone before embarkation, to exclude all those suffering from infectious complaints, and as the applicants for the trip include many nationalities it is necessary for the medical man to have a good knowledge of modern languages. St. John's Guild has also a hospital for children in New York and a seaside one at Staten Island, distant about eight miles from the city and to this the patients are conveyed by the hospital ship. The seaside hospital and hospital ship receive patients from June to September. Admission to both the ship and land hospitals is granted by means of tickets, which must be signed by a qualified medical man. A ticket for the ship is usually available for the day trip only, but weekly ones are also issued, while the seaside hospital tickets are good for two weeks or longer, at the discretion of the medical attendant. No infants are received without their mothers. It is interesting to note that the resident physician at the seaside hospital is a lady. The beneficial effects of the trips on the hospital ship has now been amply proved, and especially in the case of infants. In the continued hot weather of the present summer the carrying limit of 1600 has been many times reached. The experiment has been so decided a success in New York that it might be worth a trial in London.

DIPHTHERIA IN PUBLIC ELEMENTARY SCHOOLS.

FOR some years it has been fully recognised that the attendance of children at public elementary schools has been the main factor in the spread of diphtheria epidemics. As Sir Richard Thorne has pointed out in his article on diphtheria in Dr. Clifford Allbutt's "System of Medicine." "in day-schools, and notably in our elementary schools, early attacks of diphtheria have hitherto been apt to be overlooked; and it has not been until the attendance at schools began to diminish by reason of sickness that the matter received attention." No doubt many epidemics have been fostered and intensified in this manner. Even if the disease has been recognised and the school closed the reopening has often led to a recrudescence. In some instances this may have been due to insufficient disinfection of the buildings or to faulty drainage, but provided that every care and skill has been exercised in these matters there in another danger, which has only been comparatively recently recognised—namely, that the specific organism of the disease may exist in the fauces in a state of vitality for several weeks at least after all disappearance of local indications of any throat affection. Therefore when the utmost procurable certainty is required that any one case is no longer infectious, bacteriological examination of scrapings from the fauces is necessary. According to the report of Mr. Windle, medical officer for the district of Southall, a rapidly growing urban district of West Middlesex, diphtheria has been present in an endemic form for upwards of two years in that district and he suspected that the public elementary

schools were largely responsible for the spread of the disease. The local council and its officers had adopted every means to stay the spread of the malady; the sewerage system had been improved, disinfectants had been freely distributed, the patients had been duly isolated, and every precaution as regards cleanliness and sanitation had been adopted. Mr. Windle, however, pointed out to the board that diphtheria often occurs in so slight a form that its recognition was a matter of difficulty, and thus many cases considered by the parents of the children to be simply "sore-throats" escaped notification and were thus sources of danger to other children. He therefore suggested a very large but excellent scheme—excellent if it could only be carried out everywhere—namely, a full bi-weekly examination of all the children in the board schools. The recommendation was approved and Mr. Windle and Dr. G. B. Macdonald were appointed to carry out the former's suggestion. The method adopted was to examine the tonsils for the pathogenic bacteria, the hands for peeling, the nose and ears for traces of discharge, and the eyes for ophthalmia. In all suspicious cases the children were sent home and when the existence of infectious disease was established the children were taken to the isolation hospital. This experiment is to be tried till the end of the year. We congratulate Mr. Windle on thus acting on the courage of his convictions, and no doubt if such a thorough investigation could everywhere be carried out epidemics of diphtheria would rapidly become things of the past, but we fear the idea is Utopian. In some of the metropolitan districts many thousands of children are attending the schools, cases of diphtheria are constantly occurring as the records of the large general hospitals show, and it would be almost impossible for the medical officers attached to these districts to carry out Mr. Windle's proposal. Much has been done by improved hygienic measures to minimise the spread of diphtheria; the antitoxin treatment has lowered the mortality to an enormous extent, and the prevention of recurrences now lies mainly with the medical officers of hospitals and private practitioners, upon whom it is incumbent to make sure (preferably by bacteriological observations) that the patients' throats no longer harbour the pathogenic bacilli. If this were done as a matter of routine no doubt recrudescences would be far less common than they are at present.

THE ALBUMIN OF HÆMOGLOBIN.

HÆMOGLOBIN contains both colouring matter and albuminous compounds. To the former a considerable amount of attention has been paid, to the latter Dr. F. N. Schulz devotes an article which appears in the *Zeitschrift für Physiologischen Chemie* (Band xxiv., p. 449). Dr. Schulz names the albumin in question globin, and the method he has adopted to obtain it consists in adding a very small quantity of dilute hydrochloric acid to a watery solution of hæmoglobin derived from the blood of the horse. The solution becomes brown but remains clear, and one-fifth of its volume of alcohol is added and the colouring matter taken up by agitation with ether; the watery alcoholic solution is neutralised with ammonia, the precipitate is filtered and washed and again dissolved in water to which a few drops of acetic acid have been added. The superfluous acetic acid is removed by dialysis. The globin thus obtained, which forms about 2 per cent. of the solution, differs in its behaviour from albumin, for, in the first place, by extremely cautious addition of ammonia, it is precipitated, but is redissolved in an excess of the alkali. If the solution has been previously acidified with hydrochloric acid the addition of ammonia still occasions a precipitate, but it is no longer redissolved in an excess. Globin quickly undergoes digestion with pepsin and hydrochloric acid and in the course of four hours is converted into true peptone. When subjected to the action of trypsin it yields leucin but no tyrosin. The percentage composition of globin is C 54·97, H 7·20, N 16·89, S 0·42. The ashes contain oxide of iron, but this must be regarded as an impurity since it is probably derived from the iron of the hæmatin. Inasmuch as the globin is obtained from hæmoglobin through the agency of weak hydrochloric acid it must be regarded as pre-existing perhaps in the form of a salt or ether-like compound. On the breaking up of hæmoglobin a third body is also obtained, which, however, has not yet been isolated. In regard to the chemical nature and status of globin it would appear that in its essential characteristics it resembles histon, for it is precipitated by ammonia from its solution in hydrochloric acid, and the precipitate is insoluble in an excess of ammonia. Like histon it is precipitated by strong nitric acid in the cold, but not when heated, and, like histon, it coagulates on boiling under certain conditions, though it differs from other true products of coagulation in the remarkable facility with which it dissolves in acids. Globin does not, unlike the nucleo-histon of Lilienfeld, inhibit the coagulation of the blood. When injected into a vein it appears in the urine. Dr. Schulz suggests that many cases of albuminuria depend upon the excretion or elimination of globin. The hæmoglobin of the dog gave a globin which in all respects resembles that of the horse; on the other hand, the hæmoglobin of the blood of the goose behaves differently.

EXPERIMENTAL QUININE AMBLYOPIA.

DR. SCHWEINITZ, in an article contributed to the *Ophthalmic Record*,[1] remarks that quinine amblyopia was recognised as long ago as 1829, but that the study of complete cases of quinine amaurosis began in America in 1879, and so many cases have now been reported that from the clinical standpoint quinine blindness is one of the best-studied of the toxic amblyopias. The researches made by himself, by Dr. Brunner, and others in animals and man show that the lesion in quinine blindness is peripheral, that primarily there is an ischæmia of the retinal and optic nerve vessels caused by their intense contraction, and that if the blindness continue for a sufficient length of time atrophy of the optic nerve and optic tract associated with vascular changes indicating vasculitis and endovasculitis ensued, followed ultimately by obliteration of the lumen of the vessels. Dr. Schweinitz, in his experiments upon dogs, found that from the first to the fourth week there was pallor of the discs and great contraction of the vessels during life, whilst examination of the optic nerve with the microscope revealed imperfect differentiation of the fibrous framework and spreading apart of the individual nerve fibrils which were varicose and beginning to be atrophic. At this time there were no changes in the vessels. Later, and about from two to three months after the onset of the blindness, the discs were white and the vessels were almost entirely obliterated when examined with the ophthalmoscope, and under the microscope there was practically complete atrophy of the optic nerve fibres, thickening and collapse of the nutrient arteries of the optic nerve, and occasionally (in two specimens) obstruction of the central vessel of the nerve with a partially organised thrombosis. The atrophy extended throughout the optic nerve, chiasma, and tracts. Dr. Schweinitz proceeds to give a report of a paper by Dr. Ward Holden which was read at a meeting of the American Ophthalmological Society, in which the details are given of the examination of the brain and spinal cord. The optic nerves and eyes of numerous dogs were examined which had been killed at periods ranging from two hours to seven weeks after the first injection of quinine. It was found that as early as the third day after several toxic

[1] Vol. vii., No. 8, August, 1898, p. 392.

doses had been given some ganglion cells presented vacuolation, pallor, absence of chromophilic granules, and breaking down of the cell body, whilst analogous degenerative changes, such as the appearance of large globules of a myelin-like character, were observed in the nerve fibres. The number of cells and fibres so changed continued to increase and on the seventeenth day the first changes in the optic nerve were noticed, consisting in the breaking down of the medullary sheaths in numerous fibres. At about the end of six weeks the ganglion cell and the nerve fibre layers had almost entirely disappeared, leaving large cavities, and the myelin globules were no longer present. Many of the fibres of the optic nerve were broken down and the degeneration of the nerve could be traced up to its fibres in the external geniculate body and pulvinar. The researches of Dr. Holden therefore, whilst supporting the statements made by Dr. Schweinitz, Dr. Brunner and others, appear to demonstrate that in the first instance the effect of toxic doses of quinine is to cause spasm of the vessels, and as a result of the lessened but not obliterated blood-supply the less resistant elements of the inner layers, the ganglion cells, and nerve fibres break down, whilst the cells of the inner nuclear layer are not visibly affected. An ascending degeneration of the optic nerve fibres follows the retinal changes. The microscopical examination of the retina in other forms of toxic amblyopia might probably lead to revelations of a similar character to those in the tissue of the retina so ably described by Dr. Holden.

THE LANE MEDICAL LECTURES.

THE Lane Medical Lectures, founded in connexion with Cooper Medical College, San Francisco, were delivered this year by Dr. T. Clifford Allbutt, Regius Professor of Physic in the University of Cambridge, the subject selected being Diseases of the Heart. It is well known that this important branch of practical medicine is a favourite study with Dr. Allbutt and that he has done much to increase our knowledge of the pathology and treatment of these conditions. In his closing lecture he gave a review of the advancement of medicine during the nineteenth century, a fascinating page of recent history filled with the records of many workers whose labours have effected in almost all departments of medical science and practice such improvements as could not have been imagined a century ago. Dr. Levi Cooper Lane, the President of Cooper Medical College, informs us that Dr. Allbutt's audience were greatly impressed with his power of exposition and with his facility in drawing on his experience for instances to illustrate particular points. As our readers may recollect, the Lane Lectures were delivered in 1897 by Mr. Christopher Heath.

THE BRITISH ASSOCIATION.

THE 1898 meeting of the British Association for the Advancement of Science at Bristol will be remembered as an eventful one. To those who hold that these annual meetings are merely well-organised picnics the result must have been disappointing. The attendance was greater than usual and the interest shown in each of the sections was distinctly in advance of previous years. This can only be accounted for either by reason of the subjects being more than usually attractive or else because the public are acquiring a healthy desire for scientific knowledge. The authorities concerned in organising the meeting are to be warmly congratulated on its success, especially in view of the difficulties involved by the disastrous fire which completely destroyed Colston Hall. In spite of this deplorable occurrence there was not a single hitch in the management of the sections and meeting places. Perhaps the two great features of the meeting which will be most remembered are Sir William Crookes's remarkable Presidential Address and the story of M. De Rougemont's thrilling Robinson Crusoe-like adventures in Australia. There is much contention waging round the latter paper which promises to fill the correspondence columns of our daily newspapers for some time to come. The sectional proceedings practically closed on Monday. On Wednesday, at a meeting of the General Committee, with the President, Sir William Crookes, in the chair, it was decided to hold the next meeting at Dover, and a motion appointing Professor Michael Foster as President-elect was seconded and carried unanimously. A motion was also carried unanimously that the Archbishop of Canterbury, the Marquis of Salisbury, the Mayor of Dover, Lord Herschell, the General commanding the South-eastern district, Mr. Akers Douglas, the Dean of Canterbury, Sir Norman Lockyer, and Professor G. H. Darwin should be asked to accept the position of vice-presidents elect for the Dover meeting.

THE WRECKING OF TRAINS.

THE two recent dastardly attempts to wreck express trains on the Midland Railway, following so closely the remarkable disaster at Wellingborough, cannot be overlooked. The fact of a barrow sliding off the platform at Wellingborough on to the metals and wrecking the Manchester express, going at high speed, with loss of life and severe injuries to passengers, seems to have inspired some miscreant to attempt to bring about a similar awful result. An obstruction was found on the rails shortly after the Wellingborough accident, and close to the same spot, and again on another day a similar obstruction was found on the line at Bedford. A more wicked act than this cannot be conceived, and it is to be hoped that the cowardly and unprincipled perpetrator will be found. It is charitable to think that he is mad, but that does not reduce the necessity of employing every possible means to clap hands upon him. If it should be shown that the act was the deliberate plan of a person enjoying ordinary reason then nothing short of being hanged and quartered should be his lot. After all, it is dangerously simple to place an obstruction upon a railway line and the results may be appalling. Our great trunk lines, over which trains proceed at a great speed, run through dark and deserted places and nothing is easier than for a villainous person to place a "sleeper," "chair," or crowbar on the metals. Cannot something be done in the way of attaching a guard to the engine after the manner of an American "cow-catcher" which would at least prevent the obstruction from getting complicated with the wheels or machinery of the locomotive?

A PATHOLOGICAL PLANTAR REFLEX.

THE *Semaine Médicale*, July 27th, 1898, contains a paper by M. Babinski on a peculiar modification of the plantar reflex termed by him "the phenomenon of the toes," which he first described in 1896. In the normal plantar reflex, besides other movements, flexion of the toes on the metatarsus occurs. In some healthy individuals the toes remain, apparently at least, immobile, but they never execute movements of extension. In certain diseases, on the contrary, a movement of extension, especially of the great toe, takes place. This modification of the plantar reflex M. Babinski terms "the phenomenon of the toes." It may occur in lesser degrees—that is to say, the reflex may be partly physiological, partly pathological; there may be extension of the great toe or of the two first toes and flexion of the others, or stimulation of the external part of the sole may cause extension of the toes and stimulation of the internal part of the sole may cause flexion, or stimulation of any part of the sole may produce sometimes extension, sometimes flexion. This inversion of the normal plantar reflex is found in a

variety of diseases: in hemiplegia from any organic disease of the brain (on the paralysed side), in paraplegia, in hemiparaplegia (on the paralysed side), in Friederich's disease, in diffuse meningo-encephalitis, in cerebro-spinal meningitis and in strychnine poisoning, in Jacksonian epilepsy (on the affected side immediately after a crisis). It occurs not only in old cases of hemiplegia with rigidity, but also immediately after the onset of hemiplegia with muscular flaccidity. Similarly in spinal cases it occurs in spastic paralyses from any cause and in recent paralyses from injury of the cord with flaccidity of the muscles and diminution or abolition of the tendon reflexes. On the other hand, the phenomenon was not found in hysteria, uncomplicated tabes, anterior poliomyelitis, or in two cases of section of the spinal cord. M. Babinski points out that the diverse affections in which it is found have this in common: they bring about some perturbation in the pyramidal system, to which he attributes the phenomenon. But it does not imply a grave affection; it may occur in cases of slight and curable paralysis and disappear with the latter. Conversely, the sign may be absent in cases where the pyramidal system is profoundly altered. It may prove valuable in distinguishing organic from hysterical hemiplegia or paraplegia. Also its presence in tabes would show affection of the pyramidal system which otherwise might remain unknown. In the new-born the phenomenon occurs normally. This confirms the theory of its relation to the pyramidal system, for at birth the latter is not developed.

CHLOROFORM FOR DOGS.

IN the *Journal of Comparative Pathology and Therapeutics* for June an article appears from the pen of Professor Hobday which deals with the statistics derived from the use of chloroform in his out-patients' department at the Royal Veterinary College. Out of 500 administrations to dogs one death is recorded, that of "an aged fat pug," and a post-mortem examination revealed a ruptured portal vein. In two instances anxiety was felt; respiration ceased, but the application of artificial respiration and three minims of hydrocyanic acid (Scheele's) were given, the animals recovering. It will be remembered that Professor Hobday, guided by the presumed physiological antagonism between hydrocyanic acid and chloroform upon the respiratory centre, has advocated the employment of this acid as a means for resuscitation in overdosage with chloroform. As, however, artificial respiration, especially if done when the animal is placed on its side, is usually sufficient to bring a dog round which has been overdosed, it is difficult to feel sure that the recovery in these cases may not have been due simply to ventilation of the lungs and enforced expulsion of the chloroform vapours. 120 cats were chloroformed by Professor Hobday's method—the aspiration of air over chloroform—and of these 3 died and 1 other was only recovered by restorative measures. In this case hydrocyanic acid (Scheele's), 3 minims, was used with artificial respiration. The deaths among the cats are described and are of interest. A few whiffs of chloroform were given; in the first case the breath was apparently held before anæsthesia was achieved. As the suspension of respiration was thought to be voluntary no resuscitative measures were adopted and too late it was discovered that the cat was dead. There seems little doubt that this was a death due to direct action of too strong a vapour; many such were reported by Snow, who regarded them as arising from cardiac failure. The other deaths were due to respiratory failure the result of gradual over-dosage. The conclusions which Professor Hobday arrives at are: 1. That dogs are good subjects for chloroform when due precautions are taken in its administration and the slapdash method is laid aside for one in which the dose can be properly graduated and the quantity given controlled. Posture and restraint without interference with the movements of respiration are, he considers, of great moment. He advises the "abdominal position" (? prone) with the limbs spread-eagled and hobbled. 2. Cats he regards as much more easily killed by chloroform and requiring the greatest care in their management. Young animals are more susceptible to overdose than are older ones, the sickly and fat than the strong and well-conditioned.

CONVICTION UNDER THE DENTISTS ACT.

AT the Louth Borough Police-court on Sept. 8th, before the Mayor and other magistrates—including Dr. F. Fawssett and Dr. P. Best—Herbert Manning, 86, Upgate, Louth, was charged for that he, not being a legally qualified medical practitioner, did so use the words "Dental Institute," as to imply that he was registered under the Dentists Act, and also for that he, not being registered under the Dentists Act, 1878, did use an addition—viz., "15 years' experience in modern dentistry," implying he was a person specially qualified to practise dentistry. The defendant was warned about the large board or sign on his premises with the words "Dental Institute," but he did not remove it. He professed to do work at half the price of dentists and to correct their misfits. The Bench inflicted a fine of £7, with 26*s.* costs, or one month's imprisonment. Dr. Best stated that any qualified medical man who coöperated with an unqualified dentist in the administration of anæsthetics is liable to be struck off the Medical Register. The prosecution was conducted by Mr. R. W. Turner, barrister, on behalf of the British Dental Association.

RECOVERY AFTER WOUND OF THE HEART.

AT a meeting of the Società Lancisiana held in Rome on July 9th Dr. G. Parlavecchio described a case of punctured wound of the heart on which he had operated successfully. On the night of July 7th a man, twenty years of age, was stabbed with a knife in the fifth intercostal space on the left side in the parasternal line (the vertical line midway between the border of the sternum and the nipple). He afterwards walked a distance of more than 200 metres (218 yards) to the Hospital of San Giacomo. Five hours later he was found to be suffering from pneumothorax on the left side with extensive effusion of blood into the pleura, the area of cardiac dulness was increased, at the apex the heart sounds were confused, and at the base they seemed to be distant, the pulse was irregular, intermittent, and small. Dr. Parlavecchio suspected a wound of the heart, or at least a wound of the pericardium, but was not able to operate until eight hours after the injury. Chloroform having been given a free incision was made in the fifth intercostal space and much blood escaped on opening the pleura. After resection of the fifth rib a wound admitting two fingers was discovered in the pericardium and was enlarged so as to expose the heart, in which there was near the apex a V-shaped wound, 3½ centimetres (1½ in.) long, penetrating obliquely into the left ventricle and intermittently discharging blood. It was closed with four deeply-applied separate silk sutures, after which there was no further hæmorrhage. The pericardium and the intercostal wound were then sutured, the whole operation lasting 40 minutes. The V-shape of the wound in the heart was probably due to its movement during the infliction of the wound. The patient's survival for the 8 hours preceding the operation may be explained by occlusion of the wound by clot which was displaced during the struggling occasioned by the chloroform. According to the *Supplemento al Policlinico* of August 20th, from which the preceding is taken, the subsequent history of the case was quite uneventful and on August 14th the patient insisted on

leaving the hospital. It is added that this is the third case in which suture of a wound of the heart has been followed by recovery.

THE METROPOLITAN ASYLUMS BOARD EXPENDITURE.

IT is satisfactory to see that the Local Government Board has informed the Asylums Board that they have directed their chief inspector, Mr. W. E. Knollys, C.B., to hold after the vacation an inquiry into the causes of the excess of cost over the tenders received for the erection, &c., of the Brook Hospital, the architect's responsibility, and the supervision exercised by the committee and the managers as regards expenditure. We shall look with interest for the report of Mr. Knollys.

THE DROUGHT.

THE drought continues and the outlook in regard to water-supply is serious not only in the East of London but all over the country. It is clear that in the prolonged absence of rainfall our catchment water areas fail to afford an adequate water service and the moral of it is the necessity of adding enormously to the capacity for storage. The community must have an abundant and efficient water-supply at all times since a pure and adequate supply is the first factor in maintaining the public health. The East London Waterworks Company not much more than a year ago very materially increased their undertakings by constructing huge reservoirs near their Tottenham pumping station and they possess further powers we believe for adding again to the storage capacity. In spite of this the water-supply has failed, a fact practically admitted by the company, the admission amounting to an acknowledgment that the sources of supply, the Lee and the wells in its neighbourhood, are unequal to the increasing demand. When the enormous growth of London "over the border" is considered—the area supplied by the company—some idea of this increasing demand may be realised. We have no wish to inspire alarm, but if the present abnormally steady condition of meteorological things continues the consequences may be of the most serious kind. The rivers are depleted to the utmost, the drains are not adequately flushed, and there is little flow in the upper reaches to carry off the daily discharge of the sewage outfalls. There must be something anomalous in the fact that the first necessity of life is also employed to carry away from sight human excreta. According to the present system we draw on the river for a supply of drinking water purified with care by an elaborate scheme of filtration and then use the purified water as a means of conveying sewage back again to the same river. Thus the water in the river is withdrawn in a comparatively pure state and returned foul. With a population increasing at an almost alarming rate this state of things cannot go on much longer without disaster. If the water carriage system is to be continued the supply for drinking purposes and the supply for flushing purposes must be, we think, perfectly distinct unless a fresh and more abundant source be obtained. In this perhaps we have the most powerful argument for seeking new sources of supply. Thus, could the Welsh scheme be realised the maximum flow of the Thames and Lee would not be affected—there would be no depletion; on the contrary, the volume of the rivers would be materially augmented, the water would always be clean, and in abnormal times of drought the water catchment area of the Welsh mountains and valleys would in a way maintain the normal amount of water in these rivers. The recent records of rainfall are of interest. We are indebted to Mr. Glaisher, F.R.S., for the following figures: London average, 0·90 in.; Wales, 4·74 in. Further, there would be no need for sinking wells, which in the neighbourhood of rivers draw seriously on the flow. There is no difficulty in increasing if need be the capacity of Nature's own great storage reservoirs, as is instanced in the case of Loch Katrine, and in Wales the simplest possible engineering scheme can be turned to account in conserving colossal tanks of water in the valleys of that country on a scale quite comparable with the Scottish lakes. A member of our staff recently visited Loch Katrine and gained some interesting particulars connected with this remarkable water-supply. It has been found necessary to increase the capacity of the loch owing to the greater demands of an ever-growing population. A new tunnel of twice the calibre of the one built now nearly forty years ago is in course of construction. At present some 49,000,000 gallons of water per diem are discharged through the old tunnel, while 5,000,000 gallons are allowed as compensation to flow over the sluices at the Trossachs end of the loch so as not to spoil the flow of the river Teith. The inlet of the tunnels is about 7 ft. below the surface of the water. In view of increasing requirements the sluices are being enlarged and raised, which will bring the level of the water so many inches higher as to increase the capacity by billions of gallons, the loch being 8 miles long, and thus will meet the increased withdrawal of water by the new tunnel to Glasgow. The supply has been found to be pure, ample, and abundant for now nearly forty years without seriously affecting the volume of water or flow of the river Teith. Moreover, the water is remarkably pure and soft and strict surveillance is adopted to prevent any possible contamination. The drought has, however, affected even this great natural reservoir. We learn that the water-level has not been so low for seventeen years, the depreciation amounting to 10 in. The slightest fall of rain, however, soon restores this difference. At a time when one of the worst water famines has occurred in the history of metropolitan affairs these particulars are not without interest and instruction. As far back as forty years ago Glasgow was alive to the necessity of providing an adequate and pure supply of water. The source adopted has not only not failed, but by a simple engineering plan it may obviously be greatly increased, and there is little limit toward extending this supply in accordance with future needs. It is a similar source of supply to which, in view of present conditions, London must turn, although it must be owned that London is not so favourably situated as Glasgow in this respect. There is, however, a wonderful and inexhaustible watershed in Wales which, were it to be tapped for London's needs, would require a waterway of over 100 miles in length, but this would offer no difficulty from the engineering point of view, whilst the adoption of the scheme would solve a great sanitary problem.

THE FREQUENCY OF VOLVULUS OF THE SMALL INTESTINE.

VOLVULUS of the small intestine is generally supposed to be rare; few cases are seen either at operations or necropsies. In the *Medical Chronicle* of June, 1898, Mr. Thorburn has published some cases which tend to show that this form of intestinal obstruction is not as uncommon as is supposed and that spontaneous reduction may take place, so that neither operation nor necropsy reveals the cause of obstruction. Mr. Treves has already adopted this hypothesis as an explanation of certain cases of acute intestinal obstruction, occasionally recurrent, which recover without surgical treatment, but neither he nor others has observed the condition. Three cases are narrated. Laparotomy was performed in a case of acute intestinal obstruction; a coil of small intestine was found rotated on its mesentery. It was readily thrown back into the normal position; in fact, it fell back as soon

as it was handled. At the two ends of the coil, where the intestine crossed itself, the wall was pale and the lumen was contracted. These parts recovered their normal appearance under the eyes of the operator. A man suffered for five days from complete obstruction of sudden onset. Within a few minutes of palpation of the abdomen, while the question of operation was being discussed, the bowels were suddenly and freely moved. But the patient's prostration increased and he died in six hours. A sharply defined segment of the ileum, 6 in. in length, black and gangrenous, was found. In the third case at a laparotomy Mr. Thorburn found about 18 in. of small intestine similarly affected. In the second and third cases there is no direct evidence of volvulus, but there is no other explanation of the gangrene, for there was no hernia, old-standing peritonitis, bands, or interference with the mesenteric circulation. In the Transactions of the North of England Gynæcological Society, 1895, Dr. Donald has published a case of sharply defined gangrene of 5 ft. of ileum, which caused death thirty-five hours after ovariotomy and has adopted this explanation of a spontaneously reduced volvulus. Mr. Thorburn says that no new principles of treatment can be deduced from these cases.

ALPINE ACCIDENTS.

THE holiday season as usual is producing its annual crop of accidents. In many instances, notably those disasters which occur to persons when bathing or boating, the fault is generally their own and is due to ignorance. But we cannot always say this, for the two lamentable accidents which have lately happened in the Alps show that even when care and forethought are taken "the iced mountain top" still has its perils. All the world is the poorer for the loss of Dr. Hopkinson, the well-known electrician, and the circumstances of his death are rendered all the more sad by the loss at the same time of his three children. The peak which Dr. Hopkinson ascended, namely the Petite Dent de Veisivi, is not considered dangerous, and Dr. Hopkinson was an expert mountaineer. But he was heavily handicapped by the presence of two young and untried climbers. How the fatality happened will never be known, suffice it to say that it did happen. The other accident is notable for one of the most magnificent pieces of heroism which we can recall to mind. Professor Nasse, well known in Berlin as the assistant to Professor von Bergmann, and Dr. Borchardt, with two guides, the four roped together, were crossing the Piz Balne over a snow bridge which was considered quite safe by the guides. The bridge gave way and the leading guide and Professor Nasse fell into the crevasse. Professor Nasse had the rope round his chest and hung in mid-air for half an hour. To relieve the intolerable strain the leading guide cut the rope between himself and Professor Nasse and disappeared into the depths. The other guide and Dr. Borchardt were then able to pull Professor Nasse up, but he was dead. It is cheering to know that the guide who had so willingly offered his own life was not killed but was found unhurt by a rescue party. But as an heroic action it is beyond all praise. Men have risked their lives on the battlefield in many very noble ways, but there they have the excitement and the lust of fighting to keep them up. Here, however, there was nothing of the kind, almost certain and horrible death stared him in the face. Two actions we can recall which are in some way comparable—the one which happened in England the other day when the driver and fireman of the Great Western express stuck to their engine, so as to stop the train, although being boiled alive, and the other the well-known instance of the steersman on the burning steamer on Lake Erie who stood at the wheel while slowly scorching so that he might steer the ship safe to land. Such deeds are beyond all praise, and let us not forget them.

THE OPENING OF LABORATORIES OF PHYSIOLOGY AND PATHOLOGY AT LIVERPOOL.

AMONG those who have accepted invitations to be present on Oct. 8th at the opening, by the President of the Royal Society, Lord Lister, of the new laboratories of Physiology and Pathology given by the Rev. Mr. Thompson-Yates to University College, Liverpool, are the following: the Duke of Devonshire, Lord Derby, Lord Spencer, Lord Ripon, Lord Kelvin, Professor Michael Foster, Professor Virchow, Mr. A. J. Balfour, Sir Douglas Galton, Sir Samuel Wilks, Sir Richard Thorne, the Bishop of Chester, the Bishop of Carlisle, the Bishop of Ripon, Sir William Gairdner, Mr. Justice Kennedy, Sir James Crichton Browne, Sir Archibald Geikie, Captain Abney, C.B., Sir George King, Professor Ramsey, Professor David Ferrier, Professor Rücker, Dr. Pavy, Mr. R. B. Haldane, Sir John Batty Tuke, Sir Henry Littlejohn, Mr. Thistleton Dyer, Professor Darwin, Professor Schäfer, Professor Kanthack, Professor Burdon-Sanderson, Professor Halliburton, Professor Meldola, the Dean of Lichfield, Professor Charlton Bastian, the Hon. Sydney Holland, Professor Rose Bradford, Professor Forsyth, Professor Bower, Dr. Alexander Cope, Professor Crookshank, Dr. Lauder Brunton, Professor Waller, Professor Noel Paton, Dr. Ludwig Mond, Dr. Mott, Professor Poulton, Professor Stirling, Professor Liveing, Mr. Gerald Yeo, Professor Macallum, Dr. Byrom Bramwell, and many others well known within and outside the profession. The ceremony will commence with the conferment of the honorary degree of Doctor of Sciences upon Lord Lister at the hands of the Chancellor, Earl Spencer. Lord Lister will then, with the President, Earl Derby, proceed to open the new laboratories. In the evening a banquet will be given by the Lord Mayor in the City Hall.

THE BACILLUS OF RABIES.

THERE are many diseases the communicability, incubation, and general phenomena of which compel us to regard them as bacterial, even though the microbes should for ever elude observation. Such a disease is rabies. Pasteur to the last contented himself with the empirical procedure of attenuating the virus of a hypothetical microbe, and so long as the results he aimed at were satisfactory he worked at improving his methods, leaving the more purely scientific aspect of the question to bacteriologists in the future. Accordingly Foll, Rivolta, Ferran, and Spinelli have claimed to have detected in certain secretions and preparations a bacillus the specific character of which was made highly probable by Sanfelice, who, employing a special staining process, demonstrated its presence in large numbers in the spinal cord of a boy who had died from hydrophobia. Memmo of Rome confirmed the observation of Sanfelice and proved the virulent character of the micro-organism, which he described as a blastomycete and the presence of which he detected in several cases of rabies, but quite recently he has succeeded in cultivating it in artificial media and in reproducing by inoculations with these cultures the disease with its distinctive characters in dogs, rodents, and birds respectively. These experiments and observations, which, fulfilling the most stringent demands of bacteriological criticism, leave no room for doubt, are described in the *Centralblatt für Bakteriologie*, Abtheilung I., Band xxi., 17, 18. He found the microbe in the cerebro-spinal fluid and the substance of the brain and spinal cord, in the saliva and parotid gland, and in the aqueous humour of four dogs dying from the natural disease, and of rabbits, guinea-pigs, and pigeons in which it had been produced by inoculation. It grew better in

fluid than in solid media, the best being bouillon with glucose slightly acidulated with tartaric acid. The growth did not become manifest under a week and was easily arrested by "air infection," as through the access of dust from the laboratory. Inoculated with cultures of the fourth generation, purified by successive plate cultures, guinea-pigs and rabbits developed symptoms of paralysis of the hind limbs, &c., after from 11 to 20 days and died from the paralytic form of the disease. With dogs the inoculation was prolonged to from 30 to 60 days, when they were attacked with all the symptoms of typical natural rabies. Though Memmo does not suggest the application of his discovery to the prophylaxis of hydrophobia, it is not impossible that artificial cultures may be found capable of definite attenuation so as ultimately to simplify the methods adopted by Pasteur.

THE TREATMENT OF CHRONIC CERVICAL LYMPHADENITIS BY THE INTRODUCTION OF DRUGS INTO THE CRYPTS OF THE TONSILS.

IN the *Boston Medical and Surgical Journal* of May 19th, 1898, Dr. J. L. Goodale has described this novel and ingenious method. His observations refer to the glands at the angle of the jaw and not to the occipital, jugular, and submental glands. The difference between the stout, compact epithelium covering the exposed surface of the tonsil and the delicate loose structure lining the crypts leads him to suppose that absorption takes place chiefly through the latter. A number of foreign substances were introduced into the crypts of tonsils destined for excision and the tonsils were removed at varying intervals and examined microscopically. The substances were found to have been absorbed and to have passed into the interfollicular lymph channels. To exclude complicating influences in the cases selected for treatment adenoid hypertrophy was absent and the lymphadenitis was out of proportion to discoverable disease of the tonsil, particularly hypertrophy. In most cases a 10 per cent. aqueous solution of iodine was used. Three or four drops were drawn into a syringe through a canula, which was introduced into a crypt as far as it would go and the fluid was expelled. The injections were repeated every third or fourth day. In most cases a remarkable reduction in the glandular swelling took place. For example, a pale, poorly nourished girl, aged eight years, had a gland at the right angle of the jaw measuring 2 in. by 1 in. The gland became steadily reduced in size and in eight weeks measured ¾ in. by ½ in. In a few cases apparently suitable for this treatment no improvement resulted; possibly there was some source of infection other than the tonsils.

INSANITARY AREAS AND THE DRINK QUESTION IN LIVERPOOL

OUR readers will remember that in a recent notice of the report for 1897 of the medical officer of health of Liverpool we directed attention to his anxiety about the continued operation of intemperance in Liverpool as a cause of death, not only direct but insidious and far reaching. "Deaths attributed to excessive indulgence in drink had been more numerous than from scarlet fever or from all the other forms of fever—viz., typhus, typhoid, and simple continued fever—combined." The indirect operation of this vice was equally clear. "Proof," he said, "is clear that the poverty and the sickness and the mortality which owe their cause to excessive indulgence in drink are not fully indicated by inquests." He adds: "It will be noted that two of the areas of excessive disease and mortality dealt with by the Insanitary Property Committee (p. 142) are over-supplied with public-houses." It is not surprising that the anxiety of the medical officer of health has extended to the magistrates and that they have determined to face this problem and the means of solving it. They had objected this year to the renewal of licences in areas dealt with by the Insanitary Property Committee, and they feel that they are warranted in this course. But they have resolved to give twelve months' notice in order that both the licensees and the public shall have time to think out the question. They intimate that at the end of this period they will deal with the question of over-supply from whatever cause in every part of the city. The bench are satisfied that the houses are largely in excess of reasonable requirements and hope that the trade will take the same view. In this action the Bench will have the support of public opinion and certainly of medical opinion, which recognises in excessive drinking a most powerful factor in the destruction alike of property and of health. It may be hoped that before the lapse of a year the magistrates of the country may have the advantage of the Report of the Royal Commission on this question, which will impose a great responsibility on Her Majesty's Government. The number of public-houses is only one element in this great question, but it is an important one. Apart, as we understand, from this general resolution of the Liverpool Bench, the justices at the recent Licensing Sessions have withheld 26 licences—that is, 21 from full public-houses and 5 from beershops.

THE PREVENTION AND TREATMENT OF PULMONARY PHTHISIS.

THE movement for the repression of tuberculosis initiated at a meeting at Sir W. Broadbent's house[1] has advanced a stage further in the North of England than in the metropolis. It has been there recognised that public instruction in the principles and methods of preventive medicine as applied to tuberculous disease may form a powerful means of checking the spread of pulmonary phthisis. A society for this purpose, consisting of medical and lay members, has been formed as the outcome of a resolution passed at the annual meeting of the North of England Branch of the British Medical Association, held in the Town Hall, Sunderland, on July 11th. Although its title of "Society for the Prevention and Cure of Consumption in the County of Durham" indicates a merely local organisation the example is one which deserves to be followed everywhere and the result of such operations on a large scale would inevitably be an immediate reduction in the death-rate from this cause. The objects of the society are (1) to teach the public that consumption is an infectious disease, to show how its spread may be prevented, and to call attention to the fact that it is curable in the earlier stages in a large proportion of cases when systematically treated by the open-air method; (2) to urge upon sanitary authorities in the county the necessity of taking steps to stop its ravages and of obtaining further powers for so doing; and (3) to provide a properly-equipped open-air sanatorium for the treatment of suitable cases, admission to which will be free to the poor, but all patients who can contribute towards their maintenance ought to do so, in order that the institution may be largely self-supporting when once fully started. A meeting will be held on Sept. 20th, in the town-hall, Sunderland, for the purpose of appointing a central committee, with auxiliary committees throughout the county, to carry out the above objects. The prospectus of the society states that there are in this country 250,000 persons affected with phthisis, and that 60,000 die yearly from it. In the county of Durham, with a population of 1,128,000, the total number of deaths in 1897 was 19,464, of which 1450 were due to phthisis and 954 to other tuberculous diseases. It is also pointed out that there is in England no public provision for the rational open-air method of treatment, whilst in German open-air sanatoria, in places which have nothing special in the way of climate,

[1] THE LANCET, June 25th, 1898, p. 1768.

about 34 per cent. of recoveries are reported. The office of the society is at No. 43, West Sunniside, Sunderland.

LUNACY IN THE COLONY OF VICTORIA.

THE annual report of Mr. J. V. McCreery, inspector of lunatic asylums, shows that the total number of registered lunatics in the colony of Victoria on Dec. 31st, 1897, was 4346 (2296 males and 2050 females), of whom 4341 were on the books of the seven public asylums, the largest of which is that at Kew, containing 1021 inmates. The persons admitted during the year 1897 numbered 771, the highest admission rate recorded since the opening of the asylums and an increase of 88 as compared with the previous year. The proportion of the insane to the sane population was 1 to every 271. The recoveries were 217, against 210 discharged during the preceding year. The percentage of recoveries on admissions was 27·96 and of relieved 11·08. The number of patients who died during the year was 324, the percentage of deaths on the daily average numbers resident being 7·93. 3 patients committed suicide, 1 died through being knocked down by another patient, and 1 who assisted in cleaning lamps injected kerosene into his body and died from the results of the inflammation so caused. The general health of the asylums was good, and with the exception of a few cases of scarlet fever at the Idiot Asylum the institutions were free from contagious disease. On Jan. 1st, 1897, there were 198 patients on probation with their friends, and during the year 324 in addition were allowed out of the asylums. The system of allowing patients out on trial has been growing more and more into favour in the Victorian asylums, where it is used to a greater extent than in any other part of the world. It is considered that to allow the patient to mix in the world for a reasonable time away from the asylum restraint is a good test of mental recovery. The weekly cost of maintenance was 8*s.* 6*d.* per patient. The medical service seems not to be popular. At the date of the report there were two vacancies for junior medical officers but no applicants.

QUANTITATIVE ESTIMATION OF SUGAR IN URINE.

IN the *Deutsche Medicinische Wochenschrift* of Sept. 1st Dr. Richard Benjamin of the University Klinik in Berlin strongly recommends K. B. Lehmann's new iodine method of estimating urinary sugar on the grounds both of its precision and its convenience for medical men. It is based upon De Haën's volumetric estimation of copper by means of iodine. A definite quantity of Fehling's solution, the amount of copper in which is exactly known, is brought to the boil, treated with a measured quantity of the saccharine solution, kept boiling for some minutes, and passed through a very small filter. The filtrate and washings are made up to 250 c.c., of which 50 c.c. are treated with iodide of potassium and acidulated with sulphuric acid. The free iodine is then estimated with decinormal hyposulphite of sodium in the usual way. Dr. Benjamin says that 60 c.c. of Fehling's solution and 25 c.c. of a half per cent. or 1 per cent. saccharine solution may be used, but in some of his published experiments he took 30 c.c. of copper solution and 5 c.c. of diabetic urine. In addition to this estimation of the residual copper in solution a useful alternative method, especially when the amount of sugar is small, is to dissolve the cuprous oxide on the filter cautiously in nitric acid and estimate it volumetrically. As the nitrous acid produced by dissolving cuprous oxide in nitric acid would liberate iodine, it must be destroyed by warming with a little urea. Dr. Benjamin tested the process in a variety of ways, using saccharine solutions of known strength and also diabetic urine, both in the natural condition and diluted with an equal quantity of water and with the addition of known amounts of glucose. In all cases the results agreed very well. He found that 315 parts of copper correspond to 165·3 parts of sugar. There is a description of the process by Lehmann in vol. xxx. of the *Archiv für Hygiene* and one by E. Riegler in Part I. of the *Zeitschrift für Analytische Chemie* for 1898.

HISTOLOGY OF MUSCLE—NEURO-MUSCULAR SPINDLES.

DURING the last few years much attention has been paid to peculiar structures brought into relief by modern methods of histology to which Signor Ruffini has applied the term neuro-muscular spindles; the results of his researches are given in the July number of the *Journal of Physiology*. These structures are found scattered through the muscle but are especially numerous and closely set, as Sherrington has shown, near the tendon and in the proximity of aponeuroses and intra-muscular septa. They vary in length from about $\frac{1}{3}$ to $\frac{1}{4}$ of an inch and are about $\frac{1}{115}$th of an inch in diameter. Kölliker counted fifteen in each belly of the omohyoid of a child of four. It is remarkable, however, that they appear to be absent in the ocular muscles. Each spindle presents a certain resemblance, noticed by Ranvier, to a Pacinian body since it is enveloped in a capsule or sheath composed of concentric lamellæ of dense fibrillated connective tissue covered on each surface with a layer of endothelium and separated by a layer of lymph. The sheath is surrounded by the perimysium internum which divides it from the surrounding muscular fibres. The centre of the neuro-muscular spindle is occupied by a small fasciculus of striped muscular fibres which has been designated "Weissmann's bundle" after its discoverer. These muscular fibres are from two to twelve in number in different animals and are smaller than the ordinary fibres of the muscles, which led Hassall to regard them as subservient to the production of neuro-muscular fibres. One end of the "Weissmann bundle" is muscular, the other is tendinous. In the muscular or proximal end lie the so-called parent muscular fibres which by longitudinal division make daughter fibres. The chief interest of these neuro-muscular spindles lies in their relation to the nerves. Every neuro-muscular spindle in the cat receives a nerve fibre which just before joining the spindle almost always splits into two or more secondary divisions, which do not separate but course together and plunge into one and the same spindle. Each of these secondary divisions in turn subdivides into tertiary branches in close proximity to the Weissmann bundle, and becoming flattened and losing their myelin sheaths, end on one of the muscular fibres. There are three modes of termination. The primary ending is constituted by the nerve fibre running spirally round the muscle fibre and terminating in a free and dilated extremity, or in some instances by running for some distance straight upon the fibre, but giving off at intervals riband-like fibres which encircle the muscle fibres. In the secondary ending the branches of the nerve fibre quickly break up into a large number of varicose axis-cylinders joined together by extremely delicate and short filaments, the whole resembling a spray of flowers. In the third node or plate ending the non-myelinated nerve fibre breaks up at the preterminal node into a few short, extremely delicate, branched endings. These quickly begin to form what may be called coronets by means of rounded varicose nerve fibrils and very minute hooks set side by side. These coronets, which unite in various ways in the plate, terminate in free and enlarged ends. Signor Ruffini is unable to state definitely the function of the spindles or whether the nerves are sensory. He has satisfied himself that the plate endings have not a motor function. The original article is illustrated by some excellent drawings of the appearances see

THE OFFICIAL REPORT ON THE EPIDEMIC OF TYPHOID FEVER IN MAIDSTONE IN 1897.

IN this report three inspectors, Mr. J. S. Davy, Dr. Theodore Thomson, and Mr. Willcocks, of the Poor-law, Medical, and Engineering Departments of the Local Government Board respectively, give an account of the evidence as to the epidemic of typhoid fever given before them at a public inquiry held at Maidstone in January last and extending over eight sittings. The report with appendices makes a considerable volume of 84 pages of folio, and is illustrated by maps, diagrams, and photographs. Although it gives a clear account of the epidemic and the inspectors sum up their subject concisely and judicially, yet we must confess that we find in the report no indication of the advantage of the Local Government Board's new policy of investigating an outbreak by means of a formal public inquiry. If the purpose of the new departure was to satisfy local opinion it is quite certain that the report has appeared too late to attain its object. From a scientific standpoint the proceeding is a misfortune. Having in mind the knowledge gained in the past from the admirable investigations of epidemics made by Dr. Thomson in the ordinary course of the work of the Medical Department of the Local Government Board it seems a pity to find that at Maidstone his services were mainly utilised in hearing other people's evidence some three months after the event.

The population of the borough of Maidstone was estimated at 33,830 in 1897. The incidence of typhoid fever was as follows:—

Weekly Table of Attacks and Notifications.

Week ending	Borough of Maidstone, exclusive of county asylum.		County asylum.		Rural district of Maidstone.
	Notifications.	Attacks.	Notifications.	Attacks.	Notifications.
August 28th... ...	—	4	—	—	—
Sept. 4th	—	29	—	—	1
,, 11th	2	165	—	1	—
,, 18th	128	434	—	18	2
,, 25th	544	432	50	48	17
Oct. 2nd	529	274	—	12	6
,, 9th	246	134	39	15	8
,, 16th	116	64	9	4	4
,, 23rd	61	45	2	2	3
,, 30th	44	33	—	4	1
Nov. 6th	34	25	2	2	1
,, 13th	22	23	4	1	—
,, 20th	20	19	1	—	2
Nov. 21st to Jan. 1st.	40	30	—	—	—
Totals	1786	1711	107	107	45

The Maidstone Water Company supplied the borough from springs in three distinct gathering grounds by way of three distinct systems of mains. The incidence of the fever upon these three water areas was as follows:—

—	Houses.			Persons.		
	Supplied.	Attacked.	Per cent.	Population.	Attacked.	Per cent.
Cossington supply ...	671	19	2·8	3,355	29	0·86
Boarley supply ...	1,410	63	4·46	7,050	69	0·97
Farleigh supply ...	3,916	1,077	27·5	19,580	1,583	8·08

The altogether excessive incidence upon persons consuming Farleigh water was made more significant by various facts recorded in the report. The County Asylum, which received Farleigh water, sustained 107 attacks. In the barracks, with a population of 300, supplied from the Boarley service, and in the prison with an average population of 171 supplied both by a private well and from Boarley, not a single case of typhoid fever or diarrhœa occurred. In the rural parishes of East Farleigh and Barming, containing together a population of about 2300, a total of only 68 houses were supplied by Farleigh water. The inhabitants of these 64 houses sustained 34 attacks; in the rest of the parishes only 2 cases (as to which there were no particulars) occurred. Many other facts of this kind recorded by the inspectors put the relationship between the epidemic and Farleigh water beyond doubt. While, however, the inspectors conclude that polluted Farleigh water was the essential cause of the outbreak, and that infection from polluted soil and defective water-closets and drains played only a subordinate part in the earlier and acuter stage of the epidemic, they record their opinion that "many of the cases in the borough were due to defects of drainage and sewage, with consequent pollution of the soil of the town." These defects, as was pointed out last year by the Special Commissioner of THE LANCET, were everywhere conspicuous. In particular we learn that nearly one-half of the water-closets of the place were without mechanical means of flushing, and that a large number of the sewers were objectionable brick barrel drains. Conditions such as these probably had much concern with the considerable number of typhoid fever cases which occurred after the Farleigh water-supply had been cut off.

The Farleigh supply was derived from a series of springs in the Kentish ragstone (of the Lower Greensand series). Certain of these springs, particularly the Tutsham in Orchard, Tutsham in the Fields, and the South-eastern springs were undoubtedly fed from superficial sources, while their gathering grounds were hop and fruit gardens, heavily manured, on which great numbers of persons are employed at certain seasons of the year. Evidence was received that shortly before the epidemic the neighbourhood of some of these springs was "plentifully covered with human excrement." One of the most interesting points in this report is a diagram prepared by Mr. M. A. Adams, which suggests the manner in which after a period of drought had established cracks in the soil a sudden rainfall would have washed these surface pollutions directly to the springs. Mr. Adams also pointed out a probable relationship between meteorological conditions, rise of subsoil water in the neighbourhood of the springs, and the onset of the epidemic, and put forward some interesting views upon certain attacks of diarrhœa which had immediately preceded the outbreak. Although stating their reasons for believing that many of the springs were subject to serious risk of pollution, the inspectors state that they have no evidence to show either how the specific pollution was introduced into the supply or which of the springs was thus polluted.

Much chemical and bacteriological evidence was given at the inquiry, almost all of which tended to cast serious suspicion on the Farleigh service. It was hardly to be expected that typhoid bacilli should have been found in the Farleigh water, nor was this the case. But in certain of the springs Dr. Washbourn in September and Dr. H. E. Durham in October found typical as well as atypical bacillus coli. Dr. Sims Woodhead, called in to advise the company at a later date, found no bacillus coli which he considered typical, but he obtained colonies which he thought might be indicative of "surface relations." As the inspectors point out, the "relations" between water-supplies and the "surface" of gardens or fields like those which surround the Farleigh sources must be extremely dangerous.

Space does not permit us to dwell upon other matters in this report. The measures adopted in repression of the outbreak appear to have been thorough, although undesirable delay seems to have occurred before the water company shut off the whole of the suspected Farleigh supply. The borough hospital and temporary hospitals were freely used, 381 cases being treated. For work in the hospitals and in the town an extra staff of medical officers and 139 trained nurses were engaged and much voluntary assistance was given. An excellent organisation for washing infected linen was established, some 3600 articles being washed each week. Sewers were flushed, and the Farleigh mains were washed

out with chloride of lime solution. £27,888 were subscribed to the relief fund, including £4000 from the Lord Mayor of London's Fund. Poor-law relief was granted to the extent of nearly £1500. The execution of these emergency arrangements appears to have merited all praise. The inspectors conclude their report by expressing doubt as to whether "the regulations of the Board relating to the duties of medical officers of health and the statutes which regulate the powers and obligations of private water companies are sufficient to ensure a reasonable amount of protection to the public health."

BULUWAYO HOSPITAL.

THE medical and surgical statistics of Buluwayo Hospital for the twelve months ending June 30th, compiled by Dr. Frank Arnold, the resident surgeon, give much valuable information as to the health conditions of this part of South Africa. The total admissions during the twelve months were 1619, of whom 1204 were Europeans and 415 were natives. There were 119 deaths, 48 among the Europeans and 71 among the natives. The summary of admissions of Europeans is as follows: Malarial fever (including 8 cases of blackwater fever), 701 cases with 19 deaths; dysentery, 71 cases with 11 deaths; typhoid fever, 23 cases with 4 deaths; other diseases, 359 cases (arranged under 71 headings) with 12 deaths; poisoning, 2 cases, neither of them fatal; accidents, 48 cases with two deaths. The deaths of Europeans were due to the following causes: Malarial fever, 19; dysentery, 11; typhoid fever, 4; pneumonia, 3; heart disease, 3; Bright's disease, 1; alcoholism, 2; gunshot wound, 1; shock of injury, 1; phthisis, 1. There were 22 operations performed upon Europeans under anæsthetics (chloroform or A.C.E. mixture) without any fatal result. There were 4 post-mortem examinations. The summary of admissions of natives is as follows: Malarial fever, 133 cases with 17 deaths; dysentery, 45 cases with 19 deaths; other diseases (arranged under 41 headings), 155 cases with 32 deaths; accidents, 78 cases with 2 deaths; poisoning, 4 cases with 1 death. There were 19 post-mortem examinations. The deaths of natives were due to the following causes: Dysentery, 19; malarial fever, 17; tuberculosis, 7; pneumonia, 11; other diseases, as specified, 17. The subjoined table shows the monthly admissions for malaria, together with meteorological data supplied by the Rev. Father Barthelemy, S.J.:—

Month.	Malaria admissions.			Temperature (Fah.).		No. of rainy days.	Rain (inches).	Mean barometer (inches).	Relative humidity (per cent.).
	Europeans.	Natives.	Total.	Maximum.	Minimum.				
1897.									
July	7	3	10	75	46	0	0·00	25·83	62
August ...	6	—	6	75	48	0	0·00	25·93	63
September..	9	—	9	84	56	0	0·00	25·75	60
October ...	16	—	16	93	64	3	0·23	25·75	45
November..	23	2	25	90	63	7	3·75	25·75	59
December...	30	4	34	78	62	14	7·23	25·75	79
1898.									
January ...	42	12	54	81	62	20	8·30	25·79	79
February ...	110	27	137	79	59	5	0·19	25·78	59
March ...	144	27	171	83	60	10	2·15	25·76	59
April	154	33	187	78	57	5	0·13	25·82	58
May	108	18	126	74	50	2	0·19	25·81	49
June	62	7	69	—	—	—	—	—	—

We are indebted to Dr. Arnold for the following notes accompanying the statistics.

1. EUROPEANS.

The hospital serves as the centre for a very large area; by rail, waggon, and patrols of the British South African Police sick people are brought in from distant parts. The past "wet season" is reported to have been an unusually unhealthy one.

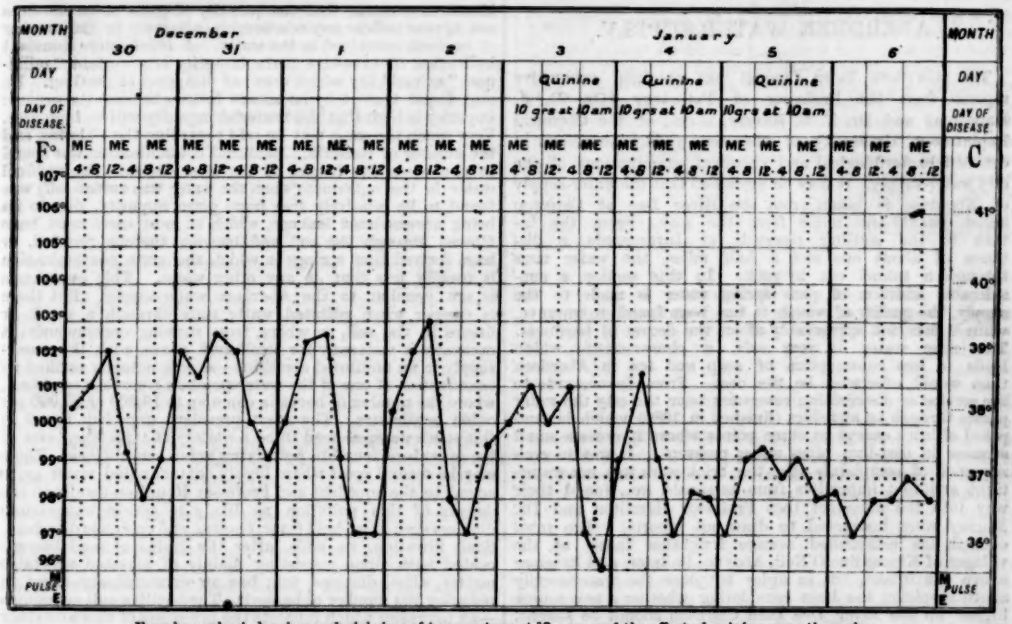
"Blackwater fever" is so called on account of the dark colour of the urine. Cases admitted here have generally come from districts known to be rife with malaria. Sometimes they have been unconscious on admission, vomiting coffee-ground-coloured remnants of food, and have died in 48 hours; at other times they come in in a state of profound anæmia with a yellowish tint of skin and conjunctivæ and temperature subnormal, urine of dark colour but giving negative results on testing for blood or bile. In a few days the temperature rises, perhaps to 103° or 104° F., vomiting of bile (green) is profuse, and the urine becomes tea-coloured and sometimes port-wine-looking; pain in the epigastrium and intense headache are complained of; the bowels are usually confined and difficult to move. As the temperature falls the urine clears and the general condition improves. Albumin may sometimes be found in the urine during the paroxysm. Generally blood can be demonstrated in the urine, either actual blood discs disorganised or hæmoglobin, but sometimes neither by microscope nor chemically can such be proved; there is simply the tea colour. In the intervals between the paroxysms the patient is sometimes markedly jaundiced and bile pigment and salts can be found in the urine. Quinine appears to be quite useless and it seems best to deal with symptoms as they arise. With proper accommodation, &c., together with some of my routine work taken by a junior—to be appointed—I hope to be able to study this variety closely the next wet season.

The antipyretics, antipyrine, antifebrin, and phenacetin, especially the last named, are of great use here in reducing high temperatures in malarial fever. Whatever may in theory be the pharmacology of these drugs in malarial fever they act rapidly, producing free perspiration and affording immediate relief of headache, &c. Where perspiration does not follow their exhibition the fall of temperature is not marked, but the distress of the patient is nevertheless relieved. It is generally supposed that the lowering of the temperature is of central action, hence this sweating is of interest.

Typhoid fever is not prevalent to any extent; the type of the past year has been markedly asthenic. Two patients died within 3 days from perforation and general peritonitis; 2 more had intestinal hæmorrhage—1 severely. Turpentine in 60-minim doses appeared to check it. The temperature charts of typhoid fever cases show peculiar rises and abnormal falls. At times a periodicity can be traced in these thermometric excursions. Enclosed is a chart showing a maximum rise at 12 noon each day, when normally the curve as a whole should be descending. The influence of quinine is well shown. The mistura chlori of Burney Yeo ("Medical Treatment") has been given largely by me. Cases seemed to do well with it. The chlorine can as described be detected in the evacuations. I have seen no cases that could be called typho-malaria, although malaria modified the temperature charts of practically every typhoid fever case and, indeed, most other charts. It is to be expected in a malarious country that the residents should show signs of the endemic disease and that these signs should be apparent whether they are suffering from another acute disorder or not.

Two deaths from acute pneumonia occurred in men admitted in an advanced stage of the disease, and a third in a chronic drunkard. All the cases of phthisis were imported and not contracted here. Only early cases of phthisis are likely to stand this climate. Except in the middle of the dry season there are factors in the climate which would be harmful to advanced cases. The dry season is ushered in in May with cold winds and at intervals fine-dust storms—these soon give way to three or four months of continuous fine dry weather, cold at night, hot in the day, with a considerable mean range of temperature. Towards the end of the dry season the heat becomes more marked, thunderstorms and magnificent displays of lightning are common, and about November deluges of rain suddenly close the dry season and mark the onset of the wet season. During this wet season the advanced phthisical subject in common with the healthy runs the risk of malaria which if contracted will handicap him in struggling against his chronic disorder. Also, the standard of personal and domestic comfort, although good and improving, is not equal to the European, this is an important item often overlooked by those who send phthisical sufferers from home.

In connexion with the two successful cases of abscess o



Four-hour chart showing malarial rises of temperature at 12 noon and the effect of quinine upon these rises.

the liver no harm resulted from exploratory aspiration—indeed, without such a proceeding the cases could not have been diagnosed. The exploring syringe was also used in two other instances without harm, although negatively. One interesting case of old injury to the skull was admitted. A European woman was struck on the forehead by a bottle. Two months later she was admitted. The sinus was 1 in. above the centre of the left orbital ridge, there was complete aphasia and right spastic hemiplegia. The temperature was 100°. I suspected frontal abscess and trephined over the sinus. The ring so removed had a hole in it and the inner table was carious. Exploration of the frontal lobe in five different directions to a depth of about 2 in. yielded nothing. The wound healed almost by first intention, the temperature fell and kept down, potassium iodide was exhibited, and complete recovery of speech and movements ensued.

In regard to the deaths, 2 were directly and 6 indirectly due to alcoholism, although the latter were admitted for other reasons.

Among the accidents there was a case of revolver-shot through the upper half of the right lobe of the liver; recovery ensued without any bad results.

2. NATIVES.

Natives do not show so good results in medical cases as Europeans. They rarely come to hospital unless they are seriously ill and a very large proportion of the fatal cases are either unconscious on admission or become so soon after. Moreover, it seems quite a matter of indifference to a native whether he does or does not recover. It is interesting to note that the death-rate from fever and dysentery is higher amongst the natives than the Europeans, showing that mortality amongst the original occupants of a country is not a safe guide to what may obtain amongst newcomers. Natives stand pain, injuries, and surgical operations well and they recover with less disablement than one would expect. Tuberculosis is certainly demonstrable post mortem, although not common; when attacking the lungs it would appear from experience in this hospital to be more often disseminated than limited to areas of consolidation. Scurvy is also seen, at times similar to ordinary European scurvy and at other times aggravated by sub-periosteal hæmorrhage of the long bones of the legs, hæmorrhage into the muscles of the calf, along fasciæ such as the fascia lata of the thigh, and into the knee-joints. Such cases generally die from some complication such as dysentery, &c. Treatment seems futile; limejuice, raw meat juice, citrates of the alkalies, iodides, calcium chloride, iron, cod liver oil, and the whole list of supposed remedies for scurvy fail. One case of acute scurvy-rickets in a boy of about twelve or fourteen years of age is now in hospital and resisting all treatment. It is significant that natives confined in the gaol and others admitted here for prolonged treatment for, say accidents, frequently develop scurvy although no fault can be found with diet and surroundings. A "Kaffir small-pox" occurs here. One such case developed in hospital, with the usual premonitory symptoms of ordinary small-pox. The eruption which appeared on the fourth day was vesicular with some umbilicated and shotty spots and was distributed over the face and body generally. It is a disputed point whether such cases are genuine small-pox or an aggravated chicken-pox. The disease runs riot amongst the natives and sometimes leaves scars. It is apparently not communicated to Europeans, it is very rapid in the development and course of the eruption, and it is not very fatal. From the character of the eruption alone apart from other considerations it is impossible to distinguish it from European small-pox.

Measles, scarlet fever, diphtheria, and typhoid fever have not yet been found amongst natives at this hospital; syphilis is common and aggravated. Here are one or two cases of interest. A boy with a compound depressed fracture ¾ in. by ¼ in. of the right parietal bone close to the anterior superior angle walked up to the hospital; trephining was at once performed and the boy recovered completely. One boy was brought in dead from lightning stroke. The hair on the left temple was scorched. From the inner end of the left clavicle to the umbilicus ran a greyish narrow scar looking as though cigar ash had been rubbed along the skin; the epidermis along this scar readily rubbed off but the dermis revealed nothing and post mortem the appearances were negative; the pubic hair had been singed. The boy's clothes were wet, the right coat-sleeve was ripped open and his cap torn in two; in the pocket of his waistcoat was a penknife with the blade strongly magnetised. Of 4 cases of acute poisoning by arsenic 1 died with almost complete absence of gastric symptoms and marked cerebral symptoms closely resembling narcotic poisoning. A case of severe epistaxis of four days' standing yielded readily to administration of calcium chloride.

On June 30th the order of the Royal Red Cross was conferred on the matron of the hospital, the Rev. Mother Jacobs.

ABERDEEN WATER-SUPPLY.

THE Aberdeen Town Council has obtained exhaustive reports from the Professor of Pathology (Dr. D. J. Hamilton) and Dr. T. S. Murray, D.Sc., of the Chemical Department, University of Aberdeen, giving the results of detailed bacteriological and chemical examinations of the city water-supply. It may be explained that the water-supply of Aberdeen is taken from the River Dee at Cairnton about twenty-one miles from the city. From the intake to the settling reservoir at Invercannie, a distance of about one and a half miles, the water runs through a tunnel cut in rock. In this section a considerable addition of pure spring water is made to the supply, the quality of which it has been found to improve, while it does not appreciably affect the degree of hardness. The river water is very soft, a characteristic which leads to less consumption of soap and tea in Aberdeen than would otherwise be the case. From Invercannie to the service or distributing reservoirs near the city the water passes through an aqueduct (finished in 1866) which is composed of brick except at three points where it crosses small streams in cast-iron pipes under pressure. It was in consequence of complaints that the brick-work was not watertight and that impurities from cesspools, &c., found their way into the aqueduct that Professor Hamilton and Dr. Murray were instructed to draw up reports. The town council has established sewage irrigation farms at the villages of Kincardine O'Neil, Aboyne, Ballater, and Braemar above the intake, but in order to place the water-supply above suspicion has been considering whether a new source higher up the River Dee than Cairnton should be sought. To replace the present brick aqueduct by iron pipes would alone represent an expenditure of £125,000 and a scheme for new works from a source far up the country would probably cost nearly £500,000. Hence the desire to have scientific advice before coming to any definite resolution. As the result of a general survey of the amount of germ impurity found in the Aberdeen water Professor Hamilton says that the lowest number reached was 105 colonies per cubic centimetre on one occasion during very dry weather in the month of September, and the highest 5061 in the month of December after a heavy night's rain. The average over all points examined was 1862. He also found that whereas the water leaving the settling pond at Invercannie contained 3324 bacteria per cubic centimetre, the number rose in that entering the Mannofield reservoir after passing along the aqueduct, to 5061—a period of seventeen hours having intervened between the taking of the two samples. From these figures it would appear that the water had become distinctly contaminated in its transit. During the interval, however, it had been raining heavily, a circumstance which may have been accountable for the rise in the germ impurity. A sudden flush of rain, particularly after dry weather, is more effectual in raising the general impurity than any other natural factor, and this holds good not only of the ordinary supply from the river, but probably also of the water which gains entrance to the aqueduct through its walls. Notwithstanding occasional impurity of the jets, the water entering the aqueduct from extraneous sources, at least during dry weather, is, taken all in all, much purer than that of the river, and the admixture of this relatively pure water with the ordinary river-supply may aid in rendering the gross amount of germ impurity at the Mannofield exit less than at the Invercannie entrance. The relationship during the winter months between the colour of the water and the number of bacteria—that is to say, where the colour is high the bacterial impurity is also high—is usually pretty close but is not perfectly constant. The amount of sediment contained in the Aberdeen water is, Professor Hamilton continues, much greater than it ought to be. The brown residual matter found in certain water-pipes consists of dead vegetable substances, chiefly of peat moss, and while probably harmless—although this has been called in question—yet such sediment tends to harbour all sorts of minute animal life, such as small round worms (anguillula), infusoria, embryo leeches, &c. Portions of the slime scraped from the inside of the aqueduct swarmed with these round worms and infusoria, which were also found in considerable abundance in sediment from pipes. Professor Hamilton remarks that the quantity of gross sediment does not appear to bear any relationship whatever to the number of bacteria contained in the water. A much more constant indication of excessive germ impurity is a certain "milkiness" or turbidity which does not disappear on settling. He also found that it by no means follows because the organic impurity is high that the bacterial impurity will be high also. Very much the same may be said regarding the chlorine and the number of bacteria. Bacterial contamination was found to rise when the height of the river did so. The residual water in the aqueduct (when the water was turned off) was found to be relatively free from germ impurity, due to its being accumulated leakage, which in most cases must have filtered through the soil and become thereby purified, or been derived from springs in which the germ contamination is usually less than in any other water. This experience is not peculiar to the Aberdeen water-supply. But there is danger when polluted water runs through a crack or fissure in the soil, or where, from running continuously, it excavates a waterway for itself and mixes with the water-supply in an undiluted condition—as was actually verified by examination of one of the waterspouts in Aberdeen aqueduct, where the number of bacteria came up to 19,500 or 20,000 per cubic centimetre. The most prevalent organism found in this spout water seemed to be a variety of "proteus," one of the organisms found in putrefying animal substances. There may be several spots where highly contaminated water gains access to the aqueduct and Professor Hamilton dwells on the danger of this pollution as likely to spread water-borne diseases such as typhoid fever, cholera, and epidemic diarrhœa. Sand filtration, he adds, after the grains of sand become coated with slime consisting mainly of arrested vegetable matter, algæ, diatoms, &c., has an extraordinary effect in reducing the number of bacteria. The bacillus coli communis—an organism which inhabits the intestines of man and other animals and which is regarded as one of the characteristic bacteria of sewage—was looked for but discovered on only one occasion. The other organisms found are most likely harmless varieties. Professor Hamilton recommends (1) the furnishing of a water-tight aqueduct; (2) the purification of the water by means of settling ponds and filter beds; and (3) the removal, as far as possible, of all reservoirs, settling ponds, or other possible sources of contamination between the filter beds and the points of distribution in the city. Dr. Murray analysed 73 samples of the water. As to sediment, turbidity, and colour, he corroborates Professor Hamilton. In general the water was palatable and inodorous. The organic matter in the Aberdeen water is essentially of vegetable origin, owing chiefly to the extensive beds of peat on the higher gathering ground. Waters taken from Loch Muick and the River Muick were found to be unpolluted. No polluting influence from the irrigation farms was detected, but these farms may not prove completely equal to the work at the end of winter after prolonged frost. The filtering of the water is desirable and Dr. Murray considers that, in one way or another, the aqueduct should be made watertight. The water-supply was found to be of very varying quality.

BATTLE OF THE CLUBS.

EAST SUBURBAN MEDICAL PROTECTION AND MEDICO-ETHICAL SOCIETY.

THE membership of this society is open to "duly registered medical practitioners and other professional persons." The annual subscription is 10*s.* 6*d.* and the society's present address is at West Ham Hospital, E. The objects which the society has in view, as described at length in the memorandum of association, form a very comprehensive programme, the first five sections of which are as follows: *(a)* The investigation and the suppression of abuses in medical charities; *(b)* obtaining, or attempting to obtain, adequate representation of medical practitioners on the governing or managing bodies of medical charities; *(c)* suppressing, or attempting to suppress, medical aid societies and clubs which are not carried on by duly registered medical practitioners and in an honourable, professional, and satisfactory manner; *(d)* establishing a public medical service, a hospital, or dispensary chiefly managed by registered medical practitioners if and when

desired by a majority of the members in general meeting assembled; and (*e*) engaging, or assisting to engage, district, monthly, or other nurses for remuneration, to work under the sole direction of duly registered medical practitioners. The other objects include the undertaking of prosecutions, debt-collecting, carrying on a medical agency for the sale of practices, keeping a register of defaulting patients, &c.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN thirty-three of the largest English towns 6320 births and 5287 deaths were registered during the week ending Sept. 10th. The annual rate of mortality in these towns, which had increased in the eight preceding weeks from 14·7 to 24·4 per 1000, further rose last week to 24·6. In London the rate was 23·2 per 1000, while it averaged 25·5 in the thirty-two provincial towns. The lowest death-rates in these towns were 16·4 in Cardiff, 17·2 in Oldham, 17·3 in Portsmouth, and 17·4 in Swansea; the highest rates were 30·5 in Preston, 31·3 in Blackburn, 33·9 in Newcastle-upon-Tyne, and 35·5 in Salford and in Sunderland. The 5287 deaths in these towns included 1578 which were referred to the principal zymotic diseases, against 1541 and 1646 in the two preceding weeks; of these, 1318 resulted from diarrhœa, 82 from whooping-cough, 62 from diphtheria, 48 from "fever" (principally enteric), 39 from measles, 29 from scarlet fever, and not 1 from small-pox. The lowest death-rates from these diseases were recorded in Portsmouth, Cardiff, Swansea, and Huddersfield; and the highest rates in Wolverhampton, Preston, Bolton, Hull, and Sunderland. The greatest mortality from measles occurred in Plymouth; from scarlet fever in Wolverhampton; from whooping-cough in Sunderland; and from diarrhœa in Croydon, Wolverhampton, Blackburn, Bolton, Preston, Hull, and Sunderland. The 62 deaths from diphtheria included 30 in London, 5 in Manchester, 5 in Leeds, 4 in Swansea, and 3 in Birkenhead. No fatal case of small-pox was registered last week in any of the thirty-three large towns; and only 3 small-pox patients were under treatment in the Metropolitan Asylum Hospitals on Saturday last, Sept. 10th. The number of scarlet fever patients in these hospitals and in the London Fever Hospital at the end of last week was 2300, against 2241, 2178, and 2240 on the three preceding Saturdays; 273 new cases were admitted during last week, against 187, 182, and 238 in the three preceding weeks. The deaths referred to diseases of the respiratory organs in London, which had been 135 and 127 in the two preceding weeks, rose again to 130 last week, but were 18 below the corrected average. The causes of 42, or 0·8 per cent. of the deaths in the thirty-three towns were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in Bristol, Bradford, Hull, Newcastle-upon-Tyne, and in fifteen other smaller towns; the largest proportions of uncertified deaths were registered in West Ham, Swansea, Norwich, Liverpool, and Sheffield.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in the eight Scotch towns, which had increased in the three preceding weeks from 18·1 to 19·8 per 1000, further rose to 23·0 during the week ending Sept. 10th, but was 1·6 per 1000 below the mean rate during the same period in the thirty-three large English towns. The rates in the eight Scotch towns ranged from 18·7 in Perth and 20·7 in Paisley, to 23·8 in Greenock and 29·3 in Leith. The 695 deaths in these towns included 92 which were referred to diarrhœa, 22 to whooping-cough, 9 to measles, 9 to "fever" (principally enteric), 6 to scarlet fever, and 2 to diphtheria. In all, 140 deaths resulted from these principal zymotic diseases against 140 and 124 in the two preceding weeks. These 140 deaths were equal to an annual rate of 4·7 per 1000, which was 2·6 per 1000 below the mean rate last week from the same diseases in the thirty-three large English towns. The fatal cases of diarrhœa, which had been 89 and 81 in the two preceding weeks, rose again to 92 last week, of which 45 occurred in Glasgow, 19 in Edinburgh, 9 in Dundee, and 8 in Leith. The 22 deaths from whooping-cough corresponded with the number recorded in the preceding week, and included 10 in Glasgow and 4 in Dundee. The deaths referred to different forms of "fever," which had been 9 in each of the four preceding weeks, were again 9 last week, of which 4 occurred in Glasgow and 4 in Paisley. Of the 9 fatal cases of measles 4 were recorded in Glasgow and 3 in Edinburgh. The 6 deaths from scarlet fever exceeded by 1 the number in the preceding week, and included 4 in Glasgow, where the 2 fatal cases of diphtheria were also registered. The deaths referred to diseases of the respiratory organs in these towns, which had been 64 and 72 in the two preceding weeks, further rose to 100 last week, and exceeded by 22 the number in the corresponding period of last year. The causes of 32, or nearly 5 per cent., of the deaths in these eight towns last week were not certified.

HEALTH OF DUBLIN.

The death-rate in Dublin, which had been 22·4 and 27·6 per 1000 in the two preceding weeks, further rose to 30·7 during the week ending Sept. 10th. During the past four weeks the rate of mortality in the city has averaged 25·6 per 1000, the rate during the same period being 22·5 in London and 18·1 in Edinburgh. The 206 deaths registered in Dublin during the week under notice showed an increase of 21 upon the number in the previous week, and included 54 which were referred to the principal zymotic diseases, against 29 and 39 in the two preceding weeks; of these, 38 resulted from diarrhœa, 6 from whooping-cough, 5 from "fever," 2 from diphtheria, 2 from scarlet fever, and 1 from measles. These 54 deaths were equal to an annual rate of 8·1 per 1000, the zymotic death-rate during the same period being 6·3 in London and 4·2 in Edinburgh. The fatal cases of diarrhœa, which had increased from 4 to 33 in the seven preceding weeks, further rose to 38 last week. The 6 deaths from whooping-cough showed an increase of 2 upon the number in the preceding week. The deaths referred to different forms of "fever" which had been 3 and 1 in the two preceding weeks, rose again to 5 last week. The mortality from scarlet fever and from diphtheria also exceeded that recorded in recent weeks. The 206 deaths in Dublin last week included 63 of infants under one year of age, and 46 of persons aged upwards of sixty years; the deaths both of infants and of elderly persons showed a further increase upon recent weekly numbers. Nine inquest cases and 7 deaths from violence were registered; and 59, or nearly a third, of the deaths occurred in public institutions. The causes of 13, or more than 6 per cent., of the deaths in the city last week were not certified.

VITAL STATISTICS OF LONDON DURING AUGUST, 1898.

IN the accompanying table will be found summarised complete statistics relating to sickness and mortality during August in each of the forty-three sanitary areas of London. With regard to the notified cases of infectious diseases in the metropolis last month, it appears that the number of persons reported to be suffering from one or other of the nine diseases specified in the table was equal to 6·5 per 1000 of the population, estimated at 4,504,766 persons in the middle of this year. In the three preceding months the rates had been 7·2, 7·1, and 8·1 per 1000 respectively. Among the various sanitary areas the rates were considerably below the average in Paddington, Westminster, St. James Westminster, Marylebone, Stoke Newington, St. Martin-in-the-Fields, Strand, and City of London; while they showed the largest excess in Fulham, Clerkenwell, St. George-in-the-East, Mile End Old Town, St. George Southwark, St. Olave Southwark, and Bermondsey. Five cases of small-pox were notified in London during August, against 1, 6, and 2 in the three preceding months; of these, 2 occurred in St. Pancras, 1 in Hackney, 1 in City of London, and 1 in Battersea sanitary areas. Two small-pox patients were admitted into the Metropolitan Asylum Hospitals during August, and remained under treatment at the end of the month. The prevalence of scarlet fever in London showed a marked decline from that recorded in the preceding month; among the various sanitary areas this disease showed the highest proportional prevalence in Hammersmith, Fulham, Clerkenwell, Mile End Old Town, Poplar, St. George Southwark, Bermondsey, and Plumstead. The Metropolitan Asylum Hospitals contained 2207 scarlet fever patients at the end of August, against 2147, 2146, and

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING AUGUST, 1898.

(Specially compiled for THE LANCET.)

SANITARY AREAS.	Estimated population in the middle of 1898.	NOTIFIED CASES OF INFECTIOUS DISEASE.										DEATHS FROM PRINCIPAL INFECTIOUS DISEASES.										Deaths from all causes.	Death-rate per 1000 living.	Deaths of infants under one year to 1000 births.
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cholera.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.†	Whooping-cough.	Typhus fever.	Enteric fever.	Other continued fevers.	Diarrhœa.	Total.	Annual rate per 1000 persons living.			
LONDON	4,504,766	5	1267	855	—	250	8	14	398	8	2805	6·5	—	94	47	121	156	—	43	3	1875	2344	5·4	8949	20·7	316
West Districts.																										
Paddington	127,480	—	24	15	—	4	—	—	9	—	52	4·3	—	4	1	3	1	—	1	—	40	50	4·1	210	17·2	346
Kensington	172,174	—	52	14	—	5	—	1	12	—	84	5·1	—	2	3	1	5	—	—	—	48	59	3·6	284	17·2	316
Hammersmith	107,370	—	49	17	—	4	1	1	8	—	80	7·8	—	2	3	2	3	—	—	—	58	68	6·6	223	21·7	330
Fulham	125,275	—	60	52	—	8	—	—	8	—	128	10·7	—	—	2	7	2	—	2	1	88	102	8·5	282	23·5	333
Chelsea	96,713	—	22	26	—	2	—	—	7	—	57	6·1	—	—	1	5	3	—	2	—	31	41	4·4	184	19·8	351
St. George Hanover-square	80,608	—	20	10	—	3	1	—	1	—	35	4·5	—	—	1	—	1	—	1	—	10	13	1·7	90	11·6	221
Westminster	52,574	—	4	5	—	6	—	—	1	—	16	3·2	—	—	—	—	3	—	—	—	13	16	3·2	91	18·0	243
St. James Westminster	22,200	—	3	1	—	—	—	—	2	—	6	2·8	—	1	2	—	—	—	—	—	1	4	1·9	36	16·9	152
North Districts.																										
Marylebone	140,483	—	19	13	—	7	—	—	19	—	58	4·3	—	3	2	—	1	—	—	—	27	33	2·4	211	15·7	206
Hampstead	78,755	—	23	10	—	5	—	—	4	—	42	5·6	—	1	—	4	—	—	1	1	7	14	1·9	87	11·5	196
St. Pancras	243,416	2	90	36	—	20	1	1	20	2	172	7·4	—	2	7	4	6	—	3	—	88	110	4·7	513	22·0	380
Islington	344,616	—	70	35	—	20	—	1	20	—	146	4·4	—	16	2	5	7	—	6	—	121	157	4·8	583	17·6	246
Stoke Newington	34,660	—	7	3	—	—	—	—	1	—	11	3·3	—	—	—	—	—	—	—	—	14	14	4·2	55	16·5	250
Hackney	219,630	1	57	60	—	19	—	2	23	—	162	7·7	—	4	2	6	5	—	7	—	91	115	5·5	434	20·6	326
Central Districts.																										
St. Giles	37,519	—	2	8	—	2	—	—	8	—	20	5·6	—	—	1	1	1	—	—	—	10	13	3·6	71	19·7	264
St. Martin-in-the-Fields	12,424	—	1	1	—	—	—	—	2	—	4	3·4	—	—	—	—	—	—	—	—	2	2	1·7	22	18·5	313
Strand	23,294	—	1	—	—	—	—	—	3	—	4	1·8	—	—	—	—	—	—	—	—	5	5	2·2	50	22·4	300
Holborn	30,056	—	8	12	—	—	—	—	1	1	22	7·6	—	—	—	1	2	—	—	—	9	12	4·2	68	23·6	483
Clerkenwell	66,120	—	43	25	—	4	—	—	8	—	80	12·6	—	2	—	2	2	—	1	—	35	42	6·6	151	23·8	356
St. Luke	41,076	—	11	13	—	—	—	—	2	—	26	6·6	—	2	—	2	3	—	—	—	25	32	8·1	111	28·2	325
City of London	29,088	1	6	—	—	1	—	—	2	—	10	3·6	—	—	1	—	—	—	—	—	2	3	1·1	38	13·6	80
East Districts.																										
Shoreditch	121,485	—	36	12	—	12	1	1	19	1	82	7·0	—	6	2	2	2	—	1	—	88	101	8·7	329	28·2	435
Bethnal Green	129,027	—	34	18	—	8	1	—	34	—	95	7·7	—	8	1	4	2	—	—	—	61	76	6·1	296	23·9	286
Whitechapel	80,559	—	20	10	—	5	—	—	6	—	41	5·3	—	2	—	—	—	—	2	—	14	18	2·3	177	22·9	256
St. George-in-the-East	48,241	—	15	13	—	4	—	—	7	—	39	8·4	—	3	1	1	—	—	2	—	14	21	4·5	131	28·3	276
Limehouse	58,661	—	13	13	—	3	—	—	5	—	34	6·0	—	3	—	2	6	—	2	—	38	51	9·1	164	29·2	447
Mile End Old Town	112,528	—	39	28	—	6	—	—	18	—	91	8·4	—	5	—	10	1	—	—	—	59	75	6·9	255	23·6	332
Poplar	170,220	—	65	28	—	10	—	—	22	—	125	7·7	—	6	1	5	5	—	3	—	108	128	7·8	404	24·7	371
South Districts.																										
St. Saviour Southwark	24,562	—	7	6	—	1	—	—	2	—	16	6·8	—	—	—	—	1	—	—	—	13	14	5·9	60	25·5	394
St. George Southwark	60,466	—	46	17	—	5	—	—	2	2	72	12·4	—	2	5	2	6	—	1	—	49	65	11·2	167	28·8	381
Newington	123,183	—	35	48	—	4	—	1	5	—	93	7·9	—	5	1	11	5	—	1	—	82	105	8·9	294	24·9	358
St. Olave Southwark	11,288	—	6	3	—	1	—	—	—	—	10	9·2	—	—	—	—	1	—	—	—	3	4	3·7	18	16·6	135
Bermondsey	85,738	—	55	21	—	8	—	—	8	—	92	11·2	—	3	3	3	6	—	1	—	30	46	5·6	189	23·0	271
Rotherhithe	40,849	—	13	2	—	2	—	—	10	—	27	6·9	—	—	—	—	1	—	—	—	8	9	2·3	80	20·4	280
Lambeth	304,073	—	64	49	—	14	2	1	26	1	157	5·4	—	5	1	10	24	—	4	1	116	161	5·5	612	21·0	302
Battersea	171,921	1	52	60	—	4	—	1	10	—	128	7·8	—	—	—	10	7	—	1	—	84	102	6·2	361	21·9	370
Wandsworth	202,526	—	33	28	—	13	—	2	16	—	92	4·7	—	1	1	4	11	—	2	—	82	101	5·2	329	16·9	278
Camberwell	261,189	—	70	50	—	8	—	—	16	—	144	5·7	—	3	2	8	10	—	2	—	118	143	5·7	482	19·2	327
Greenwich	180,441	—	33	49	—	18	1	2	14	—	117	6·8	—	—	—	4	12	—	2	—	90	108	6·2	377	21·8	321
Lewisham (excluding Penge)	88,562	—	14	18	—	5	—	—	4	1	42	4·9	—	—	—	2	3	—	—	—	45	50	5·9	174	20·5	352
Woolwich	41,478	—	10	7	—	3	—	—	2	—	22	5·5	—	—	1	—	4	—	—	—	18	23	5·8	82	20·6	279
Lee	39,717	—	7	6	—	3	—	—	6	—	22	5·8	—	3	—	—	1	—	—	—	11	15	3·9	61	16·0	275
Plumstead	62,531	—	28	13	—	1	—	—	5	—	47	7·8	—	—	1	—	3	—	—	—	19	23	3·8	113	18·8	290
Port of London	—	—	—	—	—	2	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including 17 cases of membranous croup.

† Including deaths from membranous croup.

2255 at the end of the three preceding months; the weekly admissions averaged 202, against 223, 208, and 242 in the three preceding months. The prevalence of diphtheria in London during August also showed a marked decline from that recorded in the preceding month; this disease was proportionally most prevalent in Fulham, Holborn, Clerkenwell, St. Luke, Newington, and Battersea sanitary areas. There were 865 diphtheria patients under treatment in the Metropolitan Asylums Hospitals at the end of August, against 917, 971, and 1014 at the end of the three preceding months; the weekly admissions averaged 107, against 134 and 146 in the two preceding months. The prevalence of enteric fever in London showed a further increase upon that recorded in recent months; among the various sanitary areas this disease showed the highest proportional prevalence in Westminster, Hackney, Shoreditch, Bermondsey, and Greenwich. The Metropolitan Asylums Hospitals contained 118 enteric fever patients at the end of August, against 54, 53, and 87 at the end of the three preceding months; the weekly admissions averaged 21, against 8, 11, and 16 in the three preceding months. Erysipelas was proportionally most prevalent in St. Giles, Bethnal Green, St. George-in-the-East, Mile End Old Town, and Rotherhithe sanitary areas. The 14 cases of puerperal fever notified in London during August included 2 in Hackney, 2 in Wandsworth, and 2 in Greenwich sanitary areas.

The mortality statistics in the table relate to the deaths of persons actually belonging to the various sanitary areas of the metropolis, the deaths occurring in the institutions of London having been distributed among the various sanitary areas in which the patients had previously resided. During the five weeks ending Saturday, Sept. 3rd, the deaths of 8949 persons belonging to London were registered, equal to an annual rate of 20·7 per 1000, against 15·7, 14·6 and 14·7 in the three preceding months. The lowest death-rates in the various sanitary areas were 11·5 in Hampstead, 11·6 in St. George Hanover-square, 13·6 in London City, 15·7 in Marylebone, 16·0 in Lee, 16·5 in Stoke Newington, and 16·6 in St. Olave Southwark; the highest rates were 24·9 in Newington, 25·5 in St. Saviour Southwark, 28·2 in St. Luke and in Shoreditch, 28·3 in St. George-in-the-East, 28·8 in St. George Southwark, and 29·2 in Limehouse. During the five weeks of August 2344 deaths were referred to the principal zymotic diseases in London; of these, 1875 resulted from diarrhœa, 156 from whooping-cough, 121 from diphtheria, 94 from measles, 48 from enteric fever, 47 from scarlet fever, 3 from ill-defined forms of continued fever, and not one either from typhus or small-pox. These 2344 deaths were equal to an annual rate of 5·4 per 1000; among the various sanitary areas the lowest zymotic death-rates were recorded in St. George Hanover-square, St. James Westminster, Hampstead, St. Martin-in-the-Fields, Strand, and London City; and the highest rates in Fulham, St. Luke, Shoreditch, Limehouse, Poplar, St. George Southwark, and Newington. The 1875 fatal cases of diarrhœa were as many as 833 above the corrected average number in the corresponding periods of the ten preceding years; this disease showed the highest proportional fatality in Fulham, St. Luke, Shoreditch, Limehouse, Poplar, St. George Southwark, and Newington sanitary areas. The 156 deaths referred to whooping-cough almost corresponded with the corrected average number; among the various sanitary areas this disease was proportionally most fatal in Holborn, St. Luke, Limehouse, St. George Southwark, Lambeth, and Woolwich. The 121 fatal cases of diphtheria were 77 below the corrected average number; this disease showed the highest proportional fatality in Fulham, Chelsea, Hampstead, Mile End Old Town, Newington, and Battersea sanitary areas. The 94 deaths from measles were less than half the corrected average number; among the various sanitary areas the mortality from this disease was highest in Islington, St. Luke, Shoreditch, Bethnal Green, St. George-in-the-East, and Lee. The 48 fatal cases of enteric fever were 6 below the corrected average number; the mortality from this disease showed no marked excess in any of the sanitary areas. The 47 deaths referred to scarlet fever were 58 below the corrected average number; among the various sanitary areas this disease showed the highest proportional fatality in St. James Westminster, St. George Southwark, and Bermondsey. In conclusion, it may be stated that the aggregate mortality in London last month from these principal zymotic diseases was as much as 32 per cent. above the average, owing to the excessive fatality of summer diarrhœa.

Infant mortality in London, measured by the proportion of deaths of children under one year of age to registered births, was equal to 316 per 1000, which very considerably exceeded the average, owing to the fatal prevalence of infantile diarrhœa. Among the various sanitary areas the lowest rates of infant mortality were recorded in St. George Hanover-square, Westminster, St. James Westminster, Marylebone, Hampstead, London City, and St. Olave Southwark; and the highest rates in St. Pancras, Holborn, Shoreditch, Limehouse, Poplar, St. Saviour Southwark, St. George Southwark, and Battersea.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointments are notified:—Staff-Surgeons: Jeremiah Sugrue to the *Dido;* Anthony Kidd to the *Isis*, and Edward J. Morley to the *Australia*. Surgeons: Richard A. Ross to the *Dido;* Harold G. T. Major to the *Isis;* and John A. Keogh to the *Jupiter*.

ROYAL ARMY MEDICAL CORPS.

Captain William Perceval Gore Graham retires from the service, receiving a gratuity. Surgeon-General Catherwood is selected for the appointment of Principal Medical Officer at Bengal, vice Surgeon-General Masham, retiring, and Colonel Pollock succeeds Colonel Catherwood as Principal Medical Officer at Gibraltar.

INDIA AND THE INDIAN MEDICAL SERVICE.

Captain Bird, Resident Medical Officer, Medical College Hospital, Calcutta, is appointed in addition to his own duties, to act as Professor of Physiology, Medical College Hospital, until further orders. Captain Clarkson, on return from temporary military duty, is appointed to act as Civil Surgeon of Nadia during the absence on deputation of Captain Dare, or until further orders. Major Waddell (Bengal), Chemical Examiner and Professor of Chemistry in the Medical College, Calcutta, is granted special leave on urgent private affairs for six months.

ARMY MEDICAL RESERVE OF OFFICERS.

Surgeon-Lieutenant David R. Dobie, M.D., 2nd Volunteer Battalion, the King's Scottish Borderers, to be Surgeon-Lieutenant.

VOLUNTEER CORPS.

Artillery: 2nd Cinque Ports (Eastern Division, Royal Artillery): Shepherd McCormick Boyd to be Surgeon-Lieutenant. 2nd Devonshire (Western Division, Royal Artillery): Leonard Leighton Hanham to be Surgeon-Lieutenant. 4th West Riding of Yorkshire (Western Division, Royal Artillery): Surgeon-Captain C. N. Gwynne to be Surgeon-Major, to resign his commission, with permission to retain his rank, and to wear the uniform of the corps on his retirement. *Rifle:* 7th Volunteer Battalion the Royal Scots (Lothian Regiment): Surgeon-Major J. L. Crombie to be Surgeon-Lieutenant-Colonel. 1st Volunteer Battalion the Queen's (Royal West Surrey Regiment): John Wayte to be Surgeon-Lieutenant.

THE RECENT MANŒUVRES.

Now that the manœuvres are over there is an opportunity for taking a brief retrospective view of what has been done. In the first place the weather throughout the operations was very hot—indeed sub-tropical—temperatures of 90° F. in the shade and 112° in the sun having been commonly reached. The men bore the heat and their fatigues and privations, for there were privations, well and cheerfully. The health of the troops was excellent, the sickness having been from 1 to 2 per cent., and the diseases were of a relatively trifling nature. The physique and marching powers of the troops were excellent, and we have reason to know that many officers and spectators were very agreeably surprised at the good quality of the material they saw, and at the numbers, military bearing, and physical appearance of the troops. There was comparatively but little falling out, and take them for all in all both Army Corps consisted of sturdy, active and well-set-up soldiers. The Royal Engineers' arrangements were very good. Water was a difficulty owing to the supply not being by any means so abundant as could be desired. Great care was taken to protect it from contamination. Officers commanding battalions and officers of junior rank can only see what is going on in their

immediate vicinity; they can know little or nothing of the strategical and tactical objects of the military movements. The main benefits to be derived from big military manœuvres are reserved for the generals commanding and their staffs. As regards strategy the commanders of each side had very little initiative allowed them and they had comparatively little, instead of absolute, freedom of action to deal with the actual situation as it presented itself and varied from time to time. One well-known firm undertook to supply the canteens, which is a very different thing to supplying an army in the field, a large number of things being provided in the one case which could not be furnished, or expected to be furnished, in the other. Another well-known firm supplied the hired transport. Transport is always a great practical difficulty in war and it is unfortunately the pivot on which so much depends in a campaign. The employment of civilian horses, drivers, and carts was by all accounts far from a success. It is a very general and popular belief that big contracting firms could do everything better for a force than the regular transport and supply branches of the army, but the experiment on this occasion should convince people that it is an uncommonly difficult thing to deal satisfactorily with the conditions presented by an army in the field—conditions which are quite novel to contractors. Organisation and discipline are absolutely essential in all undertakings of this kind, and the Army Service Corps did their work in a more efficient and better way than their auxiliary civil aids, only that corps was too weak, owing to the Egyptian and other campaigns, to undertake the task unaided. It is well, however, that the civil experiment has been made, because its shortcomings can be guarded against by better arrangements in the future. Lord Wolseley has called for information and full returns to be furnished to the War Office in connexion with the manœuvres. We have every reason to believe that, as far as the arrangements of the Royal Army Medical Corps were concerned, they were satisfactory and worked well.

THE LATE SPANISH-AMERICAN WAR.

The sufferings of the American soldiers from disease—especially of those of the force recently operating in Cuba—have been very great and continue to cause much indignation among the American people, whose conscience has been keenly aroused in this respect. Nothing could have exceeded, by the way, the kindness of the people to these unfortunate American soldiers; it was quite conspicuous. In addition to the malarial and climatic fevers and other disorders which may be fairly attributed to active service in Cuba, there has also been a lamentable prevalence of enteric fever among the American troops recently employed there and elsewhere. The food, it is alleged, supplied to the Cuban force was unsuitable, the hospital accommodation and sick supplies were insufficient for the purpose, the land transport was inadequate, and the shipping transport for the sick and wounded left much to be desired in various ways. Moreover, several of the military camps in America, owing to their having been badly selected and insanitary, are stated to have given rise to much preventable disease. The whole subject is, it is understood, to be investigated and reported upon by a Commission appointed by the United States Government.

GALLANTRY OF FRENCH MEDICAL OFFICERS IN THE FIELD.

The French navy has reason to be proud of its medical officers. In addition to Dr. Abbatucci, whose decoration for Soudan services was recently mentioned in this column,[1] another young naval surgeon has been rewarded with the Cross of the Legion of Honour for gallant conduct before the enemy in Madagascar. When the outpost at Bekapoka was attacked last September Dr. Rapuc, rifle in hand, ably seconded the efforts of the lieutenant in command, and by his *sangfroid* and energy materially contributed towards the discomfiture of the assailants. The following month also, while on a medical tour, this officer succeeded in effecting the escape from the rebels of almost the whole of his escort after their leader, a European sergeant, had been mortally wounded. In the same gazette the special promotion of yet another naval medical officer, Dr. Emily, is recorded on account of "exceptional services in the Oubanghi district," while a member of "the Marchand mission."

[1] THE LANCET, June 18th, 1898, p. 1718.

DEATHS IN THE SERVICES.

Surgeon-Major-General Inkson, A.M.S., retired, at Acton, on Friday, Sept. 9th, at the age of sixty-two years. He served with the Baltic Expedition of 1855, including the bombardment of Sweaborg. He was appointed an Assistant Surgeon in the Army in October, 1857. The following year he served in the Indian Mutiny campaign, including the capture of Jugdespore and three subsequent actions in October, for which he had another medal. In 1865 he was again employed on active service, this time with the Bhootan Expedition, for which he had a third medal. Surgeon-Major in March, 1873, Brigade-Surgeon in 1883, and Surgeon-Colonel in September, 1888, he became Surgeon-Major-General in 1893 and was placed on the retired list in November, 1895. The late officer was an M.D. of Edinburgh University and L.R.C.S. Edin.

Among the appointments on the personal staff of Sir William Lockhart on his assuming the command of the forces in India we notice the name of Captain Beyts, R.A.M.C., as surgeon to the Commander-in-chief.

Correspondence.

"Audi alteram partem."

THE SO-CALLED CONSERVATIVE SURGERY OF THE UTERINE APPENDAGES.

To the Editors of THE LANCET.

SIRS,—As Mr. Christopher Martin owes his education, experience and advancement in gynæcology entirely to me it is something more than a disappointment to find that he ignores or forgets some of the best instruction I ever gave him. What he refers to in his paper as valuable additions made by German authorities of recent years is merely and for the most part the discarded work of English operators of a time when Mr. Martin wore jackets. The first real piece of conservative work on the ovary and its tube was when Bantock and I discovered, almost simultaneously, that parovarian tumours could be removed entirely by enucleation and showed that they should not be classed for any purpose whatever with tumours of the ovary. From that time I have never ceased to argue that in cases of broad ligament cysts, which constitute at least 10 per cent. of all the cases reckoned as "ovariotomies," the healthy ovary and tube should be left alone. This is the only successful piece of conservative surgery in the pelvis with which I am acquainted and its success is not constant. The broad ligament is a piece of peritoneum and the ovary and tube are covered with it. If you injure the peritoneum or if inflammatory action is in any way excited in it it lies against another peritoneal surface and inevitably (so at least it appears) becomes adherent to it. If a Fallopian tube or ovary is injured they become adherent and after a time, usually years, they become cirrhotically atrophied and cause endless suffering and trouble, and their removal under these circumstances includes by far the most difficult pelvic operations we have to encounter, operations which many of those who attempt them leave unfinished and say nothing about them. On these points I have published over and over again and I have published series of cases showing that by reason of these peculiar complications the secondary operations are fatal to a terribly increased degree. The facts of these adhesions and the difficulty of overcoming them being known only to the fingers of the men operating were much doubted till I was able to show the celebrated specimens given to me by Sir Henry Littlejohn and then all doubt was set at rest.

Mr. Christopher Martin passes all this by and derives much comfort from the word "conservative." The term "conservative surgery" was invented in the reign of the late Sir William Fergusson and was greatly supported by him. Large numbers of operations of the "conservative" order were done and the victims were sent out of hospital. But in looking over the operation lists of our large hospitals now I am greatly comforted by seeing that the "conservative" class of operations are hardly performed now at all, certainly not as they were, and that flail-like limbs have gone out of fashion.

It is difficult to see why this second wave of "conservative surgery for the uterine appendages" should have its existence, for no suggestion in it has been made, but one, which was not tried in my *clientèle* in the early "eighties." That exception is "ignipuncture," though as a perfectly certain exciter of the process of peritoneal adhesion it is the last thing which could have occurred to me as reasonable.

Finally, this "conservative surgery for the uterine appendages" is to include removal of a perfectly healthy uterus. I have shown some eight or ten years ago that secondary removal of the uterus is sometimes necessary to relieve symptoms continued after removal of diseased tubes and ovaries, some 6 or 8 per cent. of the cases requiring this secondary proceeding. But any effort to make removal of the uterus an essential part of the first operation will have my strongest disapproval. Mr. Martin exaggerates the number of cases in which vulvar and vaginal atrophy occurs after removal of the appendages, but he will immensely increase it in reality if he removes the uterus with them. Further, there are strong reasons, which I have not space to give here, why in dealing with cases in which the neurotic element is a preponderating factor the uterus should be left. This subject I hope to deal with at length before long.

In conclusion, let me beg Mr. Martin and my younger brethren generally not to fall into the pit of neglecting to read what has gone before them, even in the generation immediately preceding them. Between the years 1870 and 1894 a good deal was done in Great Britain for gynæcology, and on the conservative aspect of the case we have nothing, absolutely nothing, for which we have to be beholden to our German brethren.—I am, Sirs, yours faithfully,

Birmingham, Sept. 12th, 1898. LAWSON TAIT.

THE PITCH OF THE HUMAN VOICE.

To the Editors of THE LANCET.

SIRS,—Has it been observed that some ratio exists between the set of the human ear and the (singing) pitch of the voice? During my holiday I have amused myself by forecasting the qualities of their voices, whether deep-toned or otherwise, before the vocalists whom I have met have sung. The inference is drawn from the squareness or angularity of the jaw and from the mode in which the ear is set on to the cheek, whether vertically with the face or obliquely; if vertically then a deep-toned voice belongs, but if the ear slants downwards and forwards a tenor or soprano voice accompanies. A better anatomist than myself will probably explain the reason.

I am, Sirs, yours faithfully,

ALEXANDER WALLACE, M.D. Oxon.

Colchester, Sept. 10th, 1898.

"THE PLAISTOW MATERNITY CHARITY."

To the Editors of THE LANCET.

SIRS,—To reply fully to Mr. Pritchard's letter in THE LANCET of Sept. 10th would require more time and space than his special pleading merits, but the last paragraph, in which he infers that we who employ nurses from this Home are therefore satisfied with them, claims a prompt denial. It is a case of Hobson's choice. The conditions under which we practise our profession in Plaistow make a nursing institution supported by charitable funds a necessity.

We are obliged to employ these nurses because they are the only ones available and we naturally express our thanks for the help we get. But at the same time we almost unanimously condemn the maternity department and find the training of nurses leaves much to be desired, for the nurses are responsible to a superintendent nurse and not to us and frequently our instructions are not carried out. Mr. Pritchard's "more important practitioners" will hardly thank him for the insinuation that they make use of these charity nurses, not only to enable them to keep paying patients, but even to tout for them.

I am, Sirs, yours faithfully,

Plaistow, Sept. 13th, 1898. P. NAPIER JONES.

*** In the letter from Mr. W. W. Farnfield, headed "The Plaistow Maternity Charity," printed in THE LANCET of Sept. 10th, the last three lines should have read: "St. Mary's Day Nursery and Hospital for Sick Children, Plaistow, E., is in no way connected with the Plaistow Maternity Charity."

"A CASE OF MEMBRANOUS TRACHEITIS AND LARYNGITIS WITHOUT THE PRESENCE OF DIPHTHERITIC BACILLI."

To the Editors of THE LANCET.

SIRS,—The interesting case reported by Mr. Grimes under the above heading in THE LANCET of August 13th of membranous tracheitis and laryngitis in which no diphtheria bacilli were found, draws attention to a circumstance in regard to diphtheria which is not sufficiently recognised—viz., that the term "diphtheria" requires to be now considered in a double sense. First, we have the clinical form in which the leather-like membrane from which the word "diphtheria" was derived is the prominent feature. The conclusion of the Royal Medical and Chirurgical Society's committee of 1875 that such a membranous laryngitis is identical with true diphtheria has been allowed to give too much colour to all statements on this point from English authors. It is, however, now generally recognised that in a certain proportion—14 per cent. according to Billings—there may be a membranous laryngitis or tracheitis not truly diphtherial according to the bacteriological test. I have reported such a case in my monograph on Diphtheria at p. 181. The responsible organisms in this instance were streptococci and staphylococci. Mr. Grimes does not state what they were in his case. The second form of diphtheria to which I have alluded is the bacillary, in which the clinical evidences of membrane are but very slight or may be entirely absent. According to Variot and other observers the prognosis of this form is very favourable. May I, in conclusion, once more plead that since Trousseau gave his reasons for substituting the word "diphtheria" for "diphtheritis," the use of the adjective "diphtheritic" should give way to "diphtherial"? Certainly the term "diphtheritic bacilli" does not accurately describe the Klebs-Löffler organisms of the malady.

I am, Sirs, yours faithfully,

LENNOX BROWNE, F.R.C.S. Edin., M.R.C.S. Eng.

Mansfield-street, W.

UNTOWARD RESULTS AFTER ADMINISTERING RESORCIN.

To the Editors of THE LANCET.

SIRS,—Recently I was called in consultation with another medical man to see a child and we prescribed resorcin in 2 gr. doses. The mother states that a quarter of an hour after the powder had been administered the child's mouth became inflamed and the tongue was swollen. When I saw the child the following morning blisters had been formed on the lips similar to what would have been produced by boiling water, and in addition to a thick white coating on the tongue there was a distinct excoriation outside the mouth. On making inquiries we found the drug dispensed had been exposed to light and presented the appearance of decomposition having taken place and it occurs to us that carbolic acid or other irritant may have been produced. The chemist we have reason to believe has suggested to the parents that the injury was due to the drug having been administered without a vehicle. We have never known or heard of severe results of the kind being produced by pure resorcin and we think that in the present instance decomposition or the substitution of another drug may have had much to answer for. Perhaps I ought to have mentioned that the child was suffering from cholera infantum. I enclose some of the powders and we will feel much obliged for your opinion.

I am, Sirs, yours faithfully,

Sept. 5th, 1898. L. C.

*** We have submitted the powders to our analyst for examination in THE LANCET Laboratory, but no evidence was gained that they contained anything but resorcin. The papers enclosing the powders were slightly discoloured, due to partial oxidation, resorcin especially in association with alkali absorbing oxygen from the air much in the same way as its analogue pyrogallol. Our correspondent will

find a reference on the pharmacology and therapeutics of resorcin in THE LANCET, vol. ii., 1880, p. 777, and vol. ii., 1881, p. 1065, in which it is stated that resorcin has a caustic action on the skin, and application to the moist lips causes a white eschar.—ED. L.

THE ABUSE OF NURSING CHARITIES.

(FROM OUR SPECIAL COMMISSIONER.)

(*Continued from p. 580.*)

THE first result of the attempted organisation of the medical practitioners was to retard the opening of a branch for the extension of the Plaistow Maternity Charity and District Nurses' Home to the East and West Ham districts. It was not till August 4th that the projected branch was opened. It is situated in East Ham and it is a significant fact that no medical man in that district has consented to attend to such midwifery cases as proved to be beyond the competence of the nurses. The nurses are therefore obliged to send for medical assistance to a practitioner living in the West Ham district. The feeling is strong among the members of the profession that in thus extending this nursing institution the cases of abuse will be considerably increased. As a further proof that such abuse existed several medical men related to me that they had been called in because the nurses had not given satisfaction and that in such cases they received fees of a guinea and upwards. How was it that these charity nurses were in attendance on persons who could afford to pay guinea fees? and for one person who was dissatisfied with the nurse and therefore called in a medical practitioner, how many have contented themselves with the nurses' services and not called in any medical adviser though they could well afford to pay his fee? Another local practitioner related that he had been retained to attend a woman in her confinement who could afford and had promised the usual fee. As the time drew near this woman, however, changed her mind, did not send for her medical man, but secured the services of one of the charity nurses instead. Complications arose at the confinement, the husband was alarmed and came to fetch the medical man whose services had been originally retained. When, however, my informant, the medical man in question, reached the house he found that the nurse, with other nurses to help her, had profited by the husband's absence to have the patient removed to the hospital. Here, then, we have a double abuse. Firstly, a woman who can afford to pay and had actually retained her medical attendant is persuaded at the last moment to accept instead the services of a charity nurse who should be attending only to the poor. Secondly, as the case turns out badly, the patient is carried off to the hospital while her husband has gone out to bring in the local practitioner. Thus the practitioner is deprived of his case first by the charity nurses and then by the hospital, and this was a patient who could afford to pay.

The question of the attitude that the local practitioners should observe towards these nurses is somewhat complicated and delicate. Thus a general practitioner related to me that a nurse from the Plaistow Maternity Charity came to him and asked for his assistance in a case of retained placenta. The nurse said that she had been to several other medical men and they had all refused to have anything to do with the case. My informant likewise refused. He argued that medical men should not be thus utilised at the last moment to get a nurse out of a scrape. If medical men were available on such emergencies the nurses would go round saying that a medical man was sure to follow them if needed. The patients would then not be afraid to employ only nurses and the latter would trade on the fact that they could call in the nearest practitioner if any trouble arose. This would be all the more useful to the nurses from the Plaistow Maternity Charity, as they are often too far away to get help from that institution. On the other hand, it may be argued with much force that when a life is in danger the medical practitioner should not refuse his services, even though he may by such help be aiding some system of undercutting his own profession. Perhaps the formation of a strong union may provide the answer to this problem. Alone and unaided the refusal to attend such cases is the only means of defence which the local practitioners possess, but if they have a strong union behind them they might perhaps attend, and this not only from motives of humanity, but so as to better investigate and expose the case. A strong organisation can expose a case of abuse where an individual acting alone would fail to do so. Then, again, if it be nevertheless necessary under certain circumstances to refuse attendance, it would be better that these circumstances should be clearly defined by a medical union and not by an individual practitioner. Such a decision also should be made public. It would be most lamentable and injurious to the cause of organisation if a woman in confinement lost her life because she had in her ignorance engaged a nurse in a manner not acceptable to the members of the medical profession. At least it should be made clearly evident that the widest publicity had been given to the fact that under certain clearly defined conditions medical practitioners would refuse to attend. Indeed, this refusal to attend is probably the most powerful weapon in the hands of the profession, but it must be employed with great prudence and only after the matter has been thoroughly discussed and the policy approved and sanctioned by the union. It is needless to point out the utter futility of one practitioner refusing to attend. But in this particular instance several practitioners declined to attend. There seems therefore to have been good reason for such an attitude. Then let those reasons be produced; let the union to which these gentlemen belong, the East Suburban Medical Protection Society, investigate the matter closely. If this policy of refusing to attend a case of confinement when an emergency arises and a nurse seeks to cover her responsibility is approved, the precise conditions under which it may be anticipated that medical men will withhold their services should be made widely known. This would indeed be a very effective manner of checking certain phases of abuse.

Of course such grievances are not confined solely to the Plaistow Maternity Charity and Nurses' Home. For instance, at Leytonstone a patient retained the services of her medical attendant for her confinement, the fee agreed upon being one guinea. The patient likewise engaged a nurse from the Essex Cottage Nursing Homes, which is a charity supported by voluntary contributions and by entertainments. The nurse was paid 5*s.* for her services. These nurses attend to midwifery cases for 5*s.* and the nurse in question was surprised to find that a medical practitioner had also been engaged. The nurse even went so far as to protest that this was in no way necessary. The patient, however, persisted in her resolution; she could afford the guinea and therefore she meant to have a fully qualified medical man to attend upon her, and the medical man in question related to me the incident; but, as he pointed out, for one person who acts in this manner how many are there who would easily allow themselves to be persuaded and would trust themselves entirely to the nurse, who charges only 5*s.*? Yet I am told that the nurses from the Essex Cottage Nursing Homes have no qualified practitioner to assist them. At Ilford, also, there is a nurse who is canvassing the medical men's patients for midwifery cases. She tells the people that all medical men charge at least a guinea for confinements and that she will take 5*s.* or 7*s.* 6*d.* Out of this there arises incidentally a curious question. A medical practitioner must not employ an unqualified assistant, but he is quite at liberty to send for this unqualified nurse and get her to take over some of his midwifery cases whenever he has not time to attend to them fully himself. It seems illogical that nurses may be employed, however incompetent they may be, while the unqualified assistant, though often competent and possessing considerable experience, must not be employed. Such in any case was the question which arose when discussing the position of the unqualified nurse who is canvassing for midwifery cases at Ilford. Doubtless as medical union becomes stronger and better organised we shall hear more and know more of the evils which arise from midwifery cases being left in the hands of incompetent persons.

What can be done by united action can be seen in the east suburban district of Loughton. About two years ago some charitably disposed inhabitants of Loughton wanted to establish a nursing charity. A nurse was to be imported into Loughton for the purpose of attending midwifery cases among the poorer sections of the population either for nothing or for very small fees. Fortunately the local practitioners at once took action. They were quite unanimous and declared

that such a charity would interfere with the trained nurse and the medical men established in the locality. The proposed nursing charity was successfully nipped in the bud. Instead of indiscriminate charity there is at Loughton a Maternity Club. The mothers subscribe some months in advance to this institution and when they are confined they are attended by one of the local fully-qualified practitioners and the club pays him a guinea fee. At first the subscriptions paid by the mothers did not suffice and the balance was made up by donations from charitable persons. Now, however, the Maternity Club has ceased to be a charity the members subscribe enough not only to pay the guinea fee to the medical attendant, but also to pay a nurse and to get various things specially needed at such a time. Thus there are no midwifery cases attended in Loughton for less than a guinea and one of the local practitioners assured me that during the last four years he had had no bad debts and he had not even been put to the unpleasantness of having to ask for his money. It is true that the inhabitants of Loughton are fairly prosperous. They work for the railway, for corn-merchants, and as gardeners for the local residents. The most improvident belong to the mixed gipsy class. They are not true gipsies, for when a number of gipsies were turned out of Epping Forest some of them married East-end women and thus a sort of half-breed race has grown up. They live by providing donkeys and various sorts of entertainments for the holiday folk who visit the forest. These are the only class of people at Loughton likely to give the local practitioners some trouble. There is a provident society at Loughton which is self-supporting and there are benefit societies and medical aid associations. These all pay 1*d.* a week for adults, but for children they pay less. However, as the population is exceptionally healthy and there is very little sickness these sums represent more than they would in a large town and I did not hear any complaints. The nurses from Plaistow and other and nearer nursing institutions do not come to Loughton. Yet the poor have an efficient nurse to attend to them. This is one of the "Queen's nurses" and she costs the community about £100 a year. The money is raised by subscription and managed by a committee on which the interests of both Church and Chapel are duly represented. The nurse has a cottage to live in, must not accept any fee, and only attends to others than the poor in a case of emergency. If an accident happens to a well-to-do person and the help of a nurse is required immediately then the medical attendant may send for this nurse, but she must leave the case as soon as a paid nurse has been brought down from London. It is therefore only in cases of emergency that the Queen's nurse can be employed, and on those occasions the person profiting by her services is supposed to contribute half a guinea towards her maintenance. Such a case, however, is of rare occurrence. The nurse's time is devoted to attending the poor, but she must only visit patients to whom she is sent by one of the medical men of the town. Thus the matter is entirely in the hands of the local practitioners: the nurse is there to help them and not to compete against them. The inhabitants of Loughton seem to have realised that it is the business of medical men to attend to the sick and that the best way of helping those who are ill is to help medical men to do their work. Efficient nursing is a great help; the grievance at Plaistow, East Ham, and elsewhere is not against nurses who help, but against nurses, most of them insufficiently trained, who compete against fully-trained nurses and against the medical practitioners. The fact that such a grievance does not exist at Loughton, though it prevails extensively in the immediate neighbourhood, shows what the profession can do when its members are united, and it indicates also that there is a way out of the difficulty.

NOTES FROM INDIA.

(FROM OUR SPECIAL CORRESPONDENT.)

A Third Outbreak of Plague in Bombay.—New Measures and their Probable Consequences.—Appointments of Divisional Health Officers.—Plague elsewhere.

IT cannot be disguised that Bombay is seeing the commencement of a third outbreak of the plague epidemic. The deaths during the past week have risen from 101 to 162, the type of the disease appears to be extremely virulent, and the cases are occurring in all parts of the city. Considerable anxiety is being felt and expressed in trade circles with regard to the probability of severe plague regulations being again enforced. The continuous expenditure on plague measures is also telling seriously in many quarters, and has virtually brought the finances of the Bombay Government to insolvency. The new plague powers and organisations are much the same as the old, but instead of the Plague Committee the Municipal Commissioner becomes the responsible chief plague authority. As he is interested in the municipality, and especially in its finances, whatever plague measures may be enforced will at least be subject to proper financial control.

The denial of the riots of last March being premeditated is only an official defence of departmental policy. No one believes it. I have been given an intimation that if the former obnoxious measures be reintroduced rioting will be repeated. The plague regulations being so distasteful the native leaders seek for means of counteracting them. The loss of a few lives is nothing to them and is admitted as such. They recognise the results of the last riots and almost regret that they were not brought about before, and they have the foresight to see that the enforcement of sanitary measures which lead to disturbance will assuredly be condemned and consequently withdrawn. A fight against disease when the people are against you cannot be conducted at the point of the bayonet. This, I believe, is the native opinion and indicates their future policy. If the new powers placed in the hands of the Commissioner be carried out with the martial spirit and with the military assistance of the late Plague Committee the rioting will be repeated. In view of the developing third outbreak it is to be hoped a more sympathetic course will be adopted.

In the reorganisation scheme for the Health Department of Bombay city 4 divisional health officers have been appointed. Dr. C. H. Cayley has been given No. 1 division, comprising the south of the island and the eastern district of the city. Mr. J. Leask has No. 2 division, comprising the western and central districts of the city; Mr. W. Venis No. 3 divison, comprising the northern part of the city; Dr. S. C. Hormasjee (a Parsee) No. 4 division, comprising the whole of the suburbs on the north. As Mr. J. Leask is not a medical man his appointment to such a post is a curious anomaly. His powers for administrative work are undoubted and he has acted as the assistant health officer for some years. Personally nothing but praise can be said in his favour, but in principle the appointment is wrong. Some other post might well have been given to him in order to secure his services to the corporation.

In other places plague seems more intense than it has ever been in Bombay. Dharwar district shows a death-rate of 82 per cent., Thana district of 78 per cent., Satara district of about 80 per cent., and Belgaum of 77 per cent. Also a much larger proportion of the population has been attacked. The ridiculous rules made for the English nurses at Calcutta and previously reported were withdrawn soon after they were made publicly known by the press.

MANCHESTER.

(FROM OUR OWN CORRESPONDENT.)

Infectious Diseases at Health Resorts.

IN his report on the health of Manchester for the second quarter of this year Dr. Niven draws attention to the frequency with which children contract scarlet fever and other infectious fevers at "health resorts" and to the little solicitude shown by heads of families that the quarters selected should present a clean bill of health. He points out that at most of our health resorts there are powers for the compulsory notification of infectious disease and that visitors may obtain reliable information from the local medical officers of health. It is to be feared, however, that the danger of infection cannot always be met in this way, for there is no doubt that many children are taken to these places after suffering from scarlet fever and before desquamation is finished and after measles before they are free from infection. It is clearly the duty of medical practitioners to do all they can to prevent their patients being moved before they cease to be dangerous to others.

Poisoning Attributed to Potted Shrimps.

Some 40 or more people at St. Anne's-on-the-Sea have

been made violently ill with sickness and diarrhœa from eating potted shrimps. At all events, that has been the local belief. The Lancashire coast is famous for its shrimps and it would be a serious misfortune if they were to lose their character. The shrimp-nets are plied for some miles along the coast, where a deep channel divides the foreshore from the shallow banks. It is said that the shrimps were caught, potted, and used the same day. No deaths have occurred, though some of the cases were serious. The fishermen say that the shrimps were caught where there could be no sewage pollution.

An Anti-vaccinator.

The first application under the recent Vaccination Act was made to Mr. Headlam, the stipendiary magistrate, at the Manchester city police-court on Sept. 8th. The applicant said his child was ten months old, and he asked what he should do under the circumstances, as he had not got all his papers and was going on a three months' journey. The magistrate recommended him to have the child vaccinated and after some discussion told him to make another application.

Conference on the Sewage Question.

A meeting of representatives of local authorities in the Irwell watershed, called by the River Irwell Conservancy Committee of the Salford Corporation, was held yesterday at the Salford Town Hall to consider the question of sewage disposal by land treatment. The chief outcome was a strong protest against the insistence by the Local Government Board in every case on land being purchased for the treatment of sewage. It still demands "that for every 20,000 of population ten acres of suitable land should be adopted for land filtration" whether it was possible or impossible to obtain the land. It was stated that in the Swinton and Pendlebury districts preparation had been made for the bacteriological treatment of their sewage and the effluent was satisfactory to the Mersey and Irwell Joint Committee. "But the Local Government Board would not give them power to sewer a certain portion of their district that was at present unsewered unless they undertook to buy 125 acres of land in addition to the 33 acres they had at present." It was moved: "That it be recommended that an association be formed of the local authorities within the Irwell watershed to be composed of two representatives of each authority to fully consider and report upon the following matters—namely: (*a*) the requirements of the Local Government Board with respect to filtration of sewage effluent through land; (*b*) the rights of manufacturers to turn trade liquids and refuse into the public sewers; and (*c*) the standard of purity of the effluent required by the Mersey and Irwell Joint Committee, and that each authority be required to contribute towards the incidental expenses *pro ratâ* according to population."

Sept. 13th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

Sanitary Association of Scotland.

THE twenty-fourth annual congress of this association has during the past week been in session at Rothesay, receiving a cordial welcome from the inhabitants, who were represented by the Marquis of Bute, the honorary President of the association. The President for the year is Dr. Archibald K. Chalmers, one of the medical officers of health of Glasgow. The subject of the Presidential Address was the Vital Statistics of School Ages. Dr. Chalmers took the years between the fifth and fifteenth as representing approximately the school period and showed by statistics that this period contained the healthiest years of life. Comparing the figures for 1890–92 with those for 1870–72 it appeared that the death-rate for the school age during the former period was less by 38 per cent. than during the latter. The causes of death during the school period were discussed in detail and figures were produced to show that the fatal influence of zymotic and tuberculous diseases had been very considerably reduced; also by comparison of the figures for diseases of the nervous system it was claimed that no support, but the opposite, was afforded to the contention that over-pressure in schools exercised a prejudicial influence on the nervous systems of the children. Diseases of the circulation showed an increase of 7 per cent. "at all ages," the increase being specially marked under five, where it reached 50 per cent., whilst during the school age the figures indicated a reduction of 10 per cent. The increase in the percentage of deaths from these diseases, Dr. Chalmers remarked, had been going on steadily for many years, and was not to be explained by the increasing prevalence of rheumatic disease, a circumstance which he considered suggested that greater attention should be given to the supervision and selection of games and gymnastic exercises. In this direction, as in others, children and young people needed guidance and advice. In conclusion the President claimed that the increased knowledge and improved methods of the sanitarians were already resulting in saving for the nation a large number of lives which under the conditions existing twenty years ago would have been lost. Further, as the deaths were fewer, the disabled also must be fewer, so that our school children now left the arena not only in greater numbers than their predecessors, but the proportion of those among them who were handicapped in the life race by physical disability had been diminished. Credit for this in no small measure was due to the efforts of the educational authorities to provide for the children the conditions of healthy existence and vigorous growth. The address was very cordially received.

Faculty of Physicians and Surgeons, Glasgow.

The following gentlemen, having passed the necessary examinations, have been admitted Fellows of the Faculty: Hugh Galt, M.B., C.M. Glasg., and Clarence Alfred Wright, L.R.C.P. & S. Edin., L.F.P.S. Glasg.

University of Glasgow.

Post-graduate classes in Bacteriology and Practical Pathology are to be conducted during the vacation by Professor Joseph Coats, assisted by Dr. L. R. Sutherland and Dr. Alexander Ferguson, in the Pathological Institute at the Western Infirmary.

Sept. 14th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Epidemic of Typhoid Fever at Belfast.

THE epidemic of typhoid fever still continues at Belfast and the admissions into the Union Fever Hospital were for the week ending Sept. 10th more in number than in the preceding one. There are now over 400 cases in that hospital. The type of the disease is more severe than it was in the beginning and hæmorrhage and other serious complications are more common. Everyone is waiting for the Public Health Committee to give information as to what they are doing to remedy the present most serious state of affairs and how they propose to attack the most difficult question of the admittedly deplorable sanitary condition of Belfast. It will take an enormous expenditure of money to remedy the defects of the town, but we are sure if the Public Health Committee will only face these difficulties the citizens will give them their unanimous support.

Outbreak of Fever at Markethill.

At a meeting of the Armagh Board of Guardians held on Sept. 6th Mr. Marshall reported that in Markethill, of which he is medical officer of health, there has been since July an outbreak of enteric fever and scarlet fever has also affected a number of persons. Everything is being done by Mr. Marshall to limit the spread of the disease.

Cookstown Sewerage System.

The Cookstown Board of Guardians have decided to apply for a loan of £1370 for the purpose of extending the sewerage system of Cookstown and a special committee has been appointed to discuss various matters regarding the sanitation of that town.

Water Famine at Cushendall.

Dr. Fogarty, the sanitary officer of this beautiful health resort in county Antrim, reported to the Ballycastle Board of Guardians at their meeting on Sept. 10th that the town was practically without water. The question of a water-supply will be fully considered on Sept. 24th.

The Cork Hospital Saturday Collection.

The Committee of the Cork Hospital Saturday Collection

held a meeting for the purpose of discussing whether it would be well to have the usual collection this year in view of the comparatively small sum realised last year. Some members pointed out that though the managers of certain hospitals in the city were quite willing to accept the sums apportioned to them, they rendered absolutely no assistance to the committee in organising the collection. It was accordingly suggested that the proper course to pursue would be to drop the collection for one year, and thus forcibly impress upon those concerned the importance of taking more than a passive interest in a movement designed to materially improve the financial condition of the institutions with which they are intimately connected. In the course of the discussion it was mentioned that the year the collection was inaugurated (1892) a sum of £970 was available for distribution and that last year the collection amounted to only £370. No doubt this marked decrease was in great measure due to the fact that last year the "Record Reign Fund" for the hospitals had already appealed to the charitably disposed. But even so nobody could assert that the Hospital Saturday Committee had not just grounds of complaint and it is admitted on all hands that they adopted a judicious course in summoning a meeting of the managers of the various hospitals to confer with them as to the best means of making the collection in future a distinct success. At the following meeting every hospital was well represented, promises of assistance were cheerfully given, the committee was largely increased, and the Countess of Bandon was nominated President. Her ladyship has since intimated her intention of accepting the office and doing all in her power to further a movement which appeals to the sympathies of the community at large.

Invitation to the British Association to hold their Meeting in Cork in the year 1900.

Sir Rowland Blennerhasset, President of the Queen's College, Cork, has suggested the desirability of inviting the British Association to hold their meeting in Cork in the year 1900. The suggestion has been taken up warmly by the city corporation and at a meeting of the medical profession of Cork specially convened a resolution was unanimously adopted urging the Association to accept the invitation and promising on behalf of the medical men of Cork that in case of acceptance every effort would be made to provide for the Association a most enjoyable sojourn in the capital of the south of Ireland.

Sept. 14th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Changes in the Viscera Produced by the 72 Hours' Bicycle Ride.

AT a meeting of the Academy of Science, held on August 29th, M. Regnault and M. Bianchi read a paper in which they said that on the occasion of the recent bicycle race which lasted for 72 hours they had examined the winner, the man who came in second, and the man who came in fourth. They examined them before the race, directly after it, and during the three following days. From this examination they have drawn the following conclusions: The riders have lost weight, and the size of the viscera, notably of the abdominal viscera, such as the spleen, the liver, and the stomach, have diminished. The subcutaneous fat has also disappeared. These changes are due to the small amount of food taken during the race, to the heat, to the want of sleep, and to the mental strain. The thoracic viscera—namely, the heart and the lungs—have hardly shrunk at all owing to the extra flow of blood through them produced by the hard work. The continual movement of the legs and of the pelvis, together with the bending forward of the body, have pushed up all the abdominal organs, and these in their turn have pushed up the heart and the lungs. The liver, as being most dense, has markedly pushed up the right lung and the pyloric end of the stomach has been pushed up so that the organ assumes a crescent shape, and thus food stays in it for a much longer time than usual. These displacements are very marked. The abdominal organs are raised about 4 centimetres and the heart is pushed up towards the neck from 2 to 5 centimetres. These facts form an explanation of the therapeutic use of the bicycle in various ptoses, pleurisy and too straight a position of the stomach. The heart and other viscera of these three riders were extremely powerful and so they were able to finish their ride; the other riders who had somewhat weaker hearts left off quite early in the race. It would therefore be advisable for race-riders to be examined by a medical man to see whether they are fit to stand the strain of long-distance rides.

The Medical Treatment of Epilepsy.

At the meeting of the Academy of Medicine held on Sept. 6th M. Motet referred to the researches of M. Maurice de Fleury on the medical treatment of epilepsy. His work is well worth particular attention, as the debates at the recent congress held at Angers have brought out the slight success which has attended surgical operations in epileptics. M. Motet laid great stress upon the originality of M. de Fleury's work, especially upon his statement that injections of artificial serum enhanced very considerably the sedative effect of bromide of potash. Two or three injections of the serum caused a dose of two or three grains of bromide to act just as well as the enormous dose hitherto given to epileptics, the fits are not nearly so frequent and the mental condition is greatly improved. This action of the serum appears to be due to the power which it has of relieving arterial tension and acting as a cardiac tonic.

A Quasi Laporte Case.

Paris has been within measurable distance of another Laporte case. A woman died and the medical officer of the Registrar's Department called on to certify the death gave a certificate for burial without hesitation. Two busybody neighbours, however, went to the commissary of police and declared that the woman had died after a useless and dangerous operation which she herself had told them she had undergone some days before her death. The police commissary called in another medical man who said that he could not state the cause of death without a post-mortem examination. The medical man who had attended the patient on asking for information was referred to his colleague who was to make the post-mortem examination. That very day one of the daily papers published a full account of the facts, naturally grossly exaggerated, and added that a warrant was out against the operator. Here, however, is exactly what happened. The patient suffered from metritis and used to visit her medical man daily to have the cervix uteri dressed. This was what she called "her little operation." Some days afterwards she died from cerebral hæmorrhage, hence the romance evolved by her neighbours. It is much to be desired that police officials would not be so ready to listen to accusations, and also that the daily press would not bring in a verdict of "Guilty" upon absolutely insufficient evidence.

Sept. 12th.

ROME.

(FROM OUR OWN CORRESPONDENT.)

"Contro il Coltello."

THROUGH her associated working-men's clubs Rome has taken an initiative as laudable as it is opportune. She has organised a "Lega Contro il Coltello" (League against the Knife), the instrument carried in contravention of the law by every peasant and artisan and the medium of the homicides, 4000 and upwards, annually perpetrated in Italy. The latest meeting of the League was held on Sunday, Sept. 11th, when a "Statuto" was compiled embodying the "sense" of previous meetings in a series of final resolutions. Its membership is by this time reinforced by an enormous number of "adhesions," and if, as is more than likely, it becomes the parent of other "Leghe" on similar lines in the provinces Italy will have taken a step long expected of her by contemporary Europe towards clearing her character of the stigma which has hitherto been attached to it for "priority in crimes of blood."

The Tragedy of the Quai Mont Blanc.

"Infelix! utcunque ferent ea facta minores." The pathetic Virgilian line rose to many a lip on learning this latest visitation to a House already all too sorely tried. Whatever its past may have been, the Hapsburg dynasty has illustrated the second half of the nineteenth century by as

nobly philanthropic a record as any reigning power can point to. The brothers of the late Empress—the Duke Karl Theodor and his younger brother—are well known in the medical world, the former as an ophthalmic surgeon, the latter as an authority in chest diseases, not only professionally qualified but singularly successful among the very poor of town and country, to whom their advice or treatment are restricted, while the Empress herself, conspicuous in every good work, quite shared the family predilection for charitable institutions, chiefly medical. The wretch Lucchesi could have dealt his baleful cause no more deadly blow than that which robbed humanity of such a benefactress and plunged in grief a family literally redolent of generous impulses and kindly deeds. His latest deliverance is as revoltingly cynical as any of its predecessors. In anticipation of the plea which may be set up for him he writes to a Naples journal—the *Don Marzio*—a warning to Lombroso and the Piedmontese school that their efforts to prove him a *criminel-né* had better be spared as he had all his wits about him in perpetrating the deed he glories in. All the same, I believe his antecedents are in course of investigation to show that he belonged to the class of physically as well as morally "degenerate," and enough has already been ascertained to justify Professor Lombroso in asking for opportunities to give scientific proof to his provisional view of the man's defects, organic and acquired. The study cannot but be an interesting one and must aid the endeavours of those who are pressing upon the Government a more searching examination of candidates for military service and a better inspired system of education than the traditional one which allows the promiscuous association of children in all stages of deficiency, moral and intellectual, doing no good to the mentally imbecile, while corrupting those who are normally developed.

Sept. 13th.

Medical News.

UNIVERSITY OF DURHAM: FACULTY OF MEDICINE.—At the first examination for the degree of Bachelor of Medicine, held at the College of Medicine, Newcastle-upon-Tyne, in September, the following candidates satisfied the examiners:—

OLD REGULATIONS.

1. *Chemistry with Chemical Physics.*—Arthur Hinckes Bird, L.S.A., St. Mary's Hospital; William Curling Hayward, M.R.C.S., L.R.C.P., Charing-cross Hospital; and Frederick William Woolrabe, L.R.C.P. & S. Edin., L.F.P.S.G., Melbourne University.

NEW REGULATIONS.

1. *Elementary Anatomy and Biology, Chemistry, and Physics.*—*First-class Honours:* James Bowden Waters, College of Medicine, Newcastle-upon-Tyne. *Second-class Honours:* Norman Bryan Walker, College of Medicine, Newcastle-upon-Tyne. *Pass List:* John William Crawford, William Morton Emmerson, and Guy Rowland East, College of Medicine, Newcastle-upon-Tyne; Reginald Moyle, Guy's Hospital; Robert Reid Pirrie, College of Medicine, Newcastle-upon-Tyne; Carl Anders Ryman, St. George's Hospital; Thomas Wilson and Robert Younger, College of Medicine, Newcastle-upon-Tyne.
2. *Chemistry and Physics.*—Thomas Englehart Amyot, College of Medicine, Newcastle-upon-Tyne; Anthony Bourchier Bradford, St. Thomas's Hospital; Clement Harlow Cox, Mason College, Birmingham; Charles Courtenay Gibb and Ralph Stuart Renton, College of Medicine, Newcastle-upon-Tyne; Charles Ravenscroft Stewart, St. George's Hospital; and John Benjamin Thomas, St. Mary's Hospital.
3. *Elementary Anatomy and Biology.*—Frederick George Armstong and John William Cross, College of Medicine, Newcastle-upon-Tyne; Wharram Henry Lamplough, Mason College, Birmingham; John Herbert McDowall, College of Medicine, Newcastle-upon-Tyne; Percy Montgomery Rivaz, St. Bartholomew's Hospital; and Monica Lucien Mary Robertson, London School of Medicine for Women.
4. *Elementary Anatomy, Chemistry, and Physics.*—Thomas Corrie Rutherfoord, St. Thomas's Hospital.
5. *Elementary Anatomy.*—Arthur John Spiller Brandon, St. Thomas's Hospital; Charles Fisher, St. Bartholomew's Hospital; Edward Henry Milner-Moore, St. Mary's Hospital; and John Norman Parrott, St. Mary's Hospital.

PRESENTATION.—On Sept. 6th Mr. G. H. Ward-Humphreys, M.R.C.S. Eng., L.R.C.P. Lond., of Cheltenham, was entertained at dinner at the Queen's Hotel in that town and presented with a silver tea and coffee service and silver tea-tray, designed according to the Louis Quinze period. After dinner the toast "Floreat Cheltonia" was proposed by Mr. Ward-Humphreys in an entertaining speech and responded to by Mr. Agg-Gardner.

STREET HAWKING.—The Manchester City Council at their meeting on Sept. 7th unanimously adopted a report from the Watch Committee upon the question of the regulation of street hawking by children. Powers of this kind exist in Liverpool and are found to work well.

MANCHESTER CHILDREN'S HOSPITAL.—A new ward was opened on Sept. 12th at the Manchester Children's Hospital, Pendlebury. The ward in question was used until recently for the reception of fever cases, but the acquisition by the Manchester Corporation of the Monsall Hospital has enabled the authorities at Pendlebury to utilise the ward for general purposes. The necessary alterations and improvements have cost £300 and the change will entail an increased annual expenditure of £1200.

THE half-yearly meeting of the Bristol General Hospital was held on Sept. 12th, Mr. J. S. Fry being in the chair. The chairman stated that for the first half of 1898 the in-patients numbered 1111 and that the out-patients during the same period had increased from 13,630 to 14,102. Subscriptions had slightly decreased as well as donations. Certain improvements had been made in the internal fitting of the hospital, more especially in the kitchen department. The out-patient department had been remodelled, the cost to a great extent being defrayed by a friend.

THE MIDDLESEX HOSPITAL.—The in- and out-patient departments of the Middlesex Hospital will be re-opened on Monday, Sept. 19th, for the admission of patients. The winter session of the Medical School will commence on Monday, Oct. 3rd, when an address will be delivered by Dr. Arthur Francis Voelcker, at 3 P.M., after which the prizes gained by the students during the past session will be distributed by Sir Elliott Lees, Bart., M.P., and a banquet will be held in the evening at the Café Royal under the presidency of the Right Hon. Sir Ralph Thompson, K.C.B., chairman of the council of the medical school.

CHARING-CROSS HOSPITAL MEDICAL SCHOOL AND THE HUXLEY LECTURE.—The annual dinner of the past and present students of the Charing-cross Hospital Medical School will be held in the Venetian Chamber of the Holborn Restaurant on Thursday, Oct. 6th. The chair will be taken by Dr. William Carter of Liverpool and Professor Virchow will be among the guests. Applications for tickets should be addressed to either of the secretaries, Mr. Donald Naesmyth and Mr. P. L. Daniel, at Charing-cross Hospital. We understand also that the Huxley Lecture by Professor Virchow is to be delivered in the large hall of St. Martin's Town Hall (Monday, Oct. 3rd). There are still a few tickets to be disposed of, early application for which should be made to the Dean, Charing-cross Hospital Medical School, 62, Chandos-street, W.C.

LITERARY INTELLIGENCE.—Mr. Young J. Pentland announces the following: Contributions to Clinical Medicine. By T. McCall Anderson, M.D., F.F.P.S. Glasg., Professor of Clinical Medicine to the Glasgow University; physician to the Glasgow Western Infirmary, &c.—Text-book of Physiology. By British Physiologists. Edited by E. A. Schäfer, F.R.S., Jodrell Professor of Physiology, University College, London. Vol. II.—Diseases of the Heart and Aorta. By G. A. Gibson, M.D., D.Sc., F.R.C.P. Edin., assistant physician to the Royal Infirmary; lecturer on Medicine, School of Medicine, Edinburgh.—The Principles of Treatment. By J. Mitchell Bruce, M.D., F.R.C.P. Lond., physician to, and lecturer on the Practice of Medicine at, Charing-cross Hospital; physician to the Hospital for Consumption, Brompton, London.—The Principles and Practice of Medicine. Designed for the Use of Practitioners and Students of Medicine. By William Osler, M.D., LL.D., F.R.S., F.R.C.P., Professor of Medicine in the Johns Hopkins University; physician-in-chief to the Johns Hopkins Hospital, Baltimore. Third edition.—Lectures on Giddiness and on Hysteria in the Male. By Sir Thomas Grainger Stewart, M.D. Edin., LL.D., physician-in-ordinary to Her Majesty the Queen for Scotland, Professor of the Practice of Physic and of Clinical Medicine in the University of Edinburgh.—Text-book of Medicine. By British Teachers. Edited by G. A. Gibson, M.D., D.Sc., F.R.C.S. Edin., assistant physician to the Royal Infirmary; lecturer on Medicine, School of Medicine, Edinburgh.—The Radical Cure of Hernia, Hydrocele, and Varicocele. By C. B. Lockwood, F.R.C.S. Eng., assistant surgeon and demonstrator of Practical Surgery, St. Bartholomew's Hospital;

surgeon to the Great Northern Central Hospital, London.—Manual of Midwifery. By R. Milne Murray, M.B., F.R.C.S. Edin., assistant physician to the Royal Maternity and Simpson Memorial Hospital; lecturer on Midwifery and Diseases of Women, School of Medicine, Edinburgh.—The Journal of Pathology and Bacteriology. Edited by German Sims Woodhead, M.D. Edin., director of the Laboratories of the Royal College of Physicians of London and Surgeons of England. Volume V.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward it to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, for publication in the next number.*

ASHER, A., M.B., C.M. Edin., has been appointed a Medical Referee under the Workmen's Compensation Act, 1897, for Caithness, Orkney, and Shetland.

BOND, C. HUBERT, D.Sc., M.D., Ch.M. Edin., has been appointed Senior Assistant Medical Officer to the Heath Asylum (for the County of London), Bexley, Kent.

CHESTNUTT, J., B.A., L.R.C.S., L.R.C.P. Edin., has been appointed Medical Officer for the Howden Union Workhouse and District, East Yorkshire, vice H. Tireman, deceased.

CONNON, M., M.B., C.M. Aberd., has been appointed Medical Officer of Health for the Burgh of Montrose.

CONNOP, A., L.R.C.P., L.R.C.S. Edin., L.F.P.S. Glasg., has been appointed Medical Officer for the Brailsford Sanitary District of the Ashbourne Union.

COWIE, GEORGE, M.B., C.M. Aberd., has been appointed Medical Officer for the City-road Workhouse, London.

DALLEWY, J., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer of Health by the Wem Rural District Council.

FLETCHER, F. A. C., L.R.C.P., L.R.C.S. Edin., has been re-appointed Medical Officer for the Sutton and Steeton Sanitary District of the Keighley Union.

GIBBON, A. H., L.R.C.P., F.R.C.S. Edin., L.F.P.S. Glasg., has been appointed Medical Officer of Health by the Bury Town Council.

HARRIS, F. D., M.B. Lond., L.R.C.P., M.R.C.S., D.P.H., has been re-appointed Medical Officer of Health by the St. Helen's Town Council.

INNES, J. C., L.R.C.S., L.M. Edin., has been re-appointed Medical Officer of Health for the Crawford Sanitary District of the Bakewell Union.

KNOX, J., M.D. Aberd., L.R.C.S. Edin., has been re-appointed Medical Officer of Health for the South Division of the Rural Sanitary District, Bakewell Union.

MACKENZIE, M. T., M.D. Edin., J.P., has been appointed a Medical Referee under the Workmen's Compensation Act (1897) for the Sheriffdom of Inverness, Elgin, and Nairn.

NESBITT, R., L.R.C.P., L.R.C.S. Irel., has been re-appointed Medical Officer of Health by the Sutton-in-Ashfield Urban District Council.

PATERSON, HERBERT J., M.A., M.B. Cantab., F.R.C.S. Eng., has been appointed Assistant Medical Officer for the Hospital of St. Francis, New Kent-road, S.E.

PECK, HERBERT, M.B., C.M. Edin., D.P.H. Camb., has been appointed Medical Officer of Health by the Chesterfield Rural District Council, vice Angus Macintosh, deceased.

ROBERTSON, J. A., M.D., C.M. Glasg., has been re-appointed Medical Officer by the Norman Cross District Council.

SCURFIELD, H., M.D. Edin., C.M., D.P.H. Camb., has been re-appointed Medical Officer of Health for the Borough and Port of Sunderland.

SLEITH, DAVID STUART, A.B., M.B., B.Ch., B.A.O., T.C.D., L.M., has been appointed Assistant Resident Medical Officer for the North Dublin Union.

TURNER, J. A., M.B., C.M. Edin., D.P.H. Camb., has been re-appointed Medical Officer of Health for the Ware Sanitary Rural District.

WILSON, G., M.D., C.M. Edin., D.P.H. Camb., has been re-appointed a Medical Officer by the Warwick Rural District Council.

Vacancies.

For further Information regarding each vacancy reference should be made to the advertisement (see Index).

BATH GENERAL OR ROYAL MINERAL WATER HOSPITAL.—Resident Medical Officer.

BOOTLE BOROUGH HOSPITAL.—Junior House Surgeon. Salary £40 per annum, with board, lodging, washing, &c.

BRADFORD ROYAL INFIRMARY.—Honorary Physician.

CENTRAL LONDON OPHTHALMIC HOSPITAL, Gray's-Inn-road, W.C.—House Surgeon. Board and residence provided in the Hospital.

CHELSEA, BROMPTON, and BELGRAVE DISPENSARY, 41, Sloane-square, S.W.—Surgeon.

CORNWALL COUNTY ASYLUM, Bodmin.—Junior Assistant Medical Officer. Salary £100 per annum, increasing £10 yearly to £120 per annum, with board, lodging, washing, and attendance.

COUNTY ASYLUM, Shrewsbury.—Junior Assistant Medical Officer for four years. Salary to commence at £100 per annum (and £8 in lieu of beer, &c.), with board, lodging, washing, rising to £120 at the end of two years' service.

CROYDON GENERAL HOSPITAL.—House Surgeon for two years, unmarried. Salary £100, increasing £10 per annum to £120, with board and residence in the hospital.

DOVER HOSPITAL.—House Surgeon, unmarried. Salary commencing at £100, with board and lodging.

GLASGOW EYE INFIRMARY.—Resident Assistant House Surgeon. Salary £50, with apartments and board.

HALIFAX PROVIDENT DISPENSARY.—Medical Officer. Salary to commence at £150 per annum, with house rent, rates, gas, and coals free, or furnished-rooms, with other arrangements.

HEREFORD GENERAL INFIRMARY.—Resident House Surgeon, unmarried. Salary £100 per annum, with furnished rooms, board, washing, gas, coals and attendance.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST.—Resident House Physicians.

HOSPITAL FOR DISEASES OF THE THROAT, Golden-square, W.—Three Senior Clinical Assistants. The first appointment will be for six months, but is renewable at the discretion of the Committee of Management. Also Resident Medical Officer. Salary £50 per annum, with board, residence, and washing.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, Bloomsbury, London.—Resident Medical Superintendent for one year. Salary £105 a year, with board and residence in the hospital.

JOINT COUNTIES ASYLUM, Carmarthen.—Second Assistant Medical Officer. Salary £120 per annum, advancing £10 annually to £140, with board, residence, and washing. £5 per annum in lieu of stimulants.

LONDON COUNTY ASYLUM, Claybury, Woodford-bridge, Essex.—Junior Assistant Medical Officer. Salary £150 per annum, with board, furnished apartments, and washing. Applications to the Clerk of the Asylums Committee, 21, Whitehall-place, London, S.W.

MANCHESTER SOUTHERN AND MATERNITY HOSPITAL.—Resident House Surgeon. Honorarium at the rate of £50 per annum and board.

NORFOLK AND NORWICH HOSPITAL, Norwich.—Assistant to House Surgeon for six months. Board, lodging, and washing provided. No salary.

NORTHAMPTON GENERAL INFIRMARY.—Junior Assistant House Surgeon for six months. Board, lodging, and washing provided and an honorarium of £10 given conditionally.

PADDINGTON-GREEN CHILDREN'S HOSPITAL, London, W.—House Physician, House Surgeon, each for six months. Salary at the rate of £50 per annum, with board and residence.

PRESTON ROYAL INFIRMARY.—Assistant House Surgeon. Salary £50 per annum, with board, rooms, washing, &c.

SOUTHPORT INFIRMARY.—Junior House and Visiting Surgeon for six months. Residence, board, and washing provided, and an honorarium at the rate of £30 per annum given.

ST. MARY'S CHILDREN'S HOSPITAL, Plaistow, E.—Assistant Resident Medical Officer for six months. Salary at the rate of £40 per annum, with board, lodging, and washing.

STOCKPORT INFIRMARY.—Assistant House and Visiting Surgeon. Salary £70 per annum, with board, washing, and residence. Also a Junior Assistant House Surgeon. Salary £2 per mensem, with board, washing, and residence.

SUSSEX COUNTY HOSPITAL, Brighton.—Fourth Resident Medical Officer, unmarried. Salary £30 per annum, with board, washing, and residence in the hospital.

WEST RIDING ASYLUM, Menston, near Leeds.—A Lady recently qualified, or Senior Student to act as Resident Clinical Clerk. Board and residence provided.

Births, Marriages, and Deaths.

BIRTHS.

BLIGH.—On Sept. 7th, at Caterham-valley, Surrey, the wife of William Bligh, M.B., B.S. Lond., of a daughter.

CHAMBERS.—On Sept. 9th, at Beaumont-street, Oxford, the wife of T. Rubery Chambers, L.D.S.R.C.S. Eng., of a daughter.

CONNOR.—On Sept. 6th, at Soho-square, W., the wife of S. Grahame Connor, M.B., of a daughter.

MARRIAGES.

BOYD—BEVERIDGE.—On July 30th, at St. Mary's Church, Addington, Christchurch, N.Z., by the Rev. W. S. Bean, Vicar, Alexander Brooke Boyd, M.A., M.B. Oxon., of Richmond, Nelson, to Margaret Miller, eldest daughter of Thomas Beveridge, of Fendalton, Christchurch, and formerly of Balado, Kinross-shire.

DODGSON—ATWOOD.—On Sept. 12th, at Guston, Kent, George Stanley Dodgson, M.B., B.C., son of Mr. A. Dodgson, of Headingley, Leeds, to Jaquetta Marion, younger daughter of the Rev. George Atwood, Rector of Hinton-cum-Steane, Brackley.

OLIVER—CUFF.—On Sept. 14th, at Shoreditch Tabernacle, Herbert Stedman Oliver, surgeon, of Skinner House, Lydd, Kent, to Lizzie Ridley, fourth daughter of Rev. Wm. Cuff, Amesbury House, Stoke Newington, N.

PATON—BALFOUR.—On Sept. 13th, at Dawyck Private Chapel, Peeblesshire, Diarmid Noel Paton, M.D. Edin., eldest son of Sir Noel Paton, R.S.A., to Agatha Henrietta, eldest daughter of the late Alexander Balfour, of Liverpool.

PETYT—HAMMERTON.—On Sept. 8th, at the Parish Church, Beckenham, Kent, Allan I. Petyt, M.A., M.B., B.C. Cantab., L.S.A. Lond., of Loughton, Lancs, to Kate, second daughter of Thomas Moy Hammerton, "Hollington," Beckenham.

DEATHS.

INKSON.—On Sept. 9th, at Acton, Surgeon-Major-General James Inkson, M.D., A.M.S. (retired), aged 62 years.

KINGSFORD.—On Sept. 13th, at Sunbury-on-Thames, Middlesex, Edward Kingsford, F.R.C.S., aged 31 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITORS," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this Office.

Lectures, original articles, and reports should be written on one side of the paper only, AND, WHEN ACCOMPANIED BY BLOCKS, IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers, not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index to Vol. I. of 1898, which was completed with the issue of June 25th, and the Title-page to the Volume were given in THE LANCET of July 2nd.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1898, bound in cloth, gilt lettered, price 18*s.*, carriage extra; and Cases for binding the half-year's numbers, cloth, gilt lettered, price 2*s.*, by post 2*s.* 3*d.*, can be obtained on application to the Manager, accompanied by remittance.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, W.C., are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

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ALCOHOL AS A WOUND-DRESSING.

MR. PETTON T. B. BEALE contributes to *The Phonographic Record* a note on the use of alcohol which is worthy of attention. The grounds upon which the practice is based seem reasonable and sound. After the bleeding in a wound has ceased, as Mr. Beale says, "the arterioles near the edges dilate, the edges are therefore very richly supplied with pabulum in the form of blood plasma which exudes through the walls of the capillaries. A few septic organisms gain access; they find plenty of food and multiply very rapidly, so rapidly in fact, that the phagocytes are not able to cope with them, and suppuration is the result." Taking advantage of the well-known property of alcohol to check cell growth and cell division Mr. Beale has used alcohol with excellent results; serous exudation is practically absent and wounds unite rapidly after its use. Methylated alcohol is used and before the wound is closed it is lightly swabbed out with a sponge or cotton wool pledget moistened with the spirit. The sutures having been inserted a piece of double cyanide gauze large enough to overlap the wound 4 in. in every direction is dipped in the alcohol and applied. The dressing is then completed in the usual way with gauze wrung out in 1 in 40 carbolic solution, dry salicylic wool, and the bandage. Mr. Beale has used alcohol for swabbing out abscess cavities and boils, and he describes the healing process as "remarkably rapid after its use." The alcohol, in addition to its action on the capillaries, acts as a mild antiseptic and appears to injure the tissues to the smallest possible extent. At the same time we are warned that none of our usual antiseptic precautions must be omitted.

TUBERCULOUS DISEASE OF THE ANKLE-JOINT.

To the Editors of THE LANCET.

SIRS,—A patient came to live near me with a friend suffering fearful pain in the ankle-joint. She never secured a minute's rest or peace and had not done so for a month. Large doses of opium were useless. The ankle was considerably swollen and was treated with cloths rung out with lead and opium lotion and changed frequently. Her medical adviser gave a family history of tuberculous joint disease in several members of the family who had died from tuberculous disease of joints. This patient was seen by several medical men and by a professor of surgery and they all recommended amputation of the foot. This seemed absolutely necessary to save her life, but the patient wished to have change of air before undergoing the operation. She was thirty years of age and had a family of six, who all seemed healthy and strong.

When I first saw her she was suffering the most acute pain in the ankle and had a feeling as if the part were on fire. Evidently it was of no use to apply local soothing applications, as these had proved useless, therefore we arranged to have cold water running upon the bare ankle continually night and day, with the result that in twenty-four hours the pain and burning sensation had passed away and in a few days the swelling had also gone. The water was now discontinued and the patient was given syrup of hypophosphites in large doses thrice daily and she made an uninterrupted recovery and is now in perfect health.

In several cases of tuberculous disease of the joints I have used this treatment and in every case with success. My plan has been to have a large tin reservoir hung up at the foot of the bed with a small piece of rubber tubing, of the size which is used for feeding bottles, to come from the reservoir on to the diseased joint, and to have waterproofing so arranged as to conduct the water to a vessel under the bed. When things are carefully arranged there is no inconvenience caused by the water. I am, Sirs, yours faithfully,

WM. TIPLADY, L.R.C.P. Edin., &c.

Tow Law, co. Durham, September, 1898.

"WANTED A SCHOOL FOR THE DEAF AND DUMB."

To the Editors of THE LANCET.

SIRS,—In answer to your correspondent who asks for the address of a good boarding-school for a deaf and dumb boy, I beg to refer him to the Director, School for the Deaf, 11, Fitzroy-square, under whose care I have great reason to know that he would receive the highest educational advantages, &c. I am, Sirs, yours faithfully,

Parolles-road, Highgate, N. K. LUNN.

To the Editors of THE LANCET.

SIRS,—For the information of your correspondent who is asking for the address of a good boarding-school for a deaf and dumb boy ten years old I beg to send particulars of the West of England Institution for the Deaf and Dumb. The regular charge for private pupils who board with the master and matron and sleep in special dormitories is £50 a year, but the committee have power to vary this if there are special circumstances to warrant it. I shall be happy to supply further particulars if required. I am, Sirs, yours faithfully,

Exeter, Sept. 10th, 1898. T. J. ALLEN, *Secretary.*

To the Editors of THE LANCET.

SIRS,—In reply to your correspondent's query in THE LANCET of Sept. 10th I may mention that a school for the oral education of the deaf is kept by Mr. H. N. Dixon, M.A., at Wickham House, East Park-parade, Northampton. Boarders are also received at the school of the Training College for Teachers of the Deaf, Castlebar-hill, Ealing, W.

I am, Sirs, yours faithfully,

Sept. 13th, 1898. S.

THE KINEMATOGRAPH IN MEDICINE.

THE *New York Medical Journal* publishes an article on some suggestions thrown out by M. Marcel Baudouin, the chief editor of the *Gazette Médicale de Paris*, on the uses to which the kinematograph may be put in the study and practice of medicine and surgery. The French writer points to its probable utility in such physiological studies as that of the gait in animals and in man, in medical and surgical diagnosis, especially in cases of disease characterised by abnormality of movement, such as ataxia, congenital luxation of the hip, &c., whether the fundamental disease affects the nervous, the muscular, or the osseous system, and, moreover, in teaching operative surgery. M. Baudouin says that ever since the beginning of the year 1897 he has been intending to employ the apparatus in Professor Terrier's laboratory at the Paris School of Medicine, at first for registering the successive steps in operative procedures, with the particular purpose in view, especially in operations involving the viscera, of demonstrating how far current practice is at variance with what is taught theoretically in the books. He was then going to employ it in the study of operations called rapid. Unfortunately for all these excellent purposes, however, it was found that the fund available for the laboratory did not allow of those first trials.

MUSIC IN THE SOUDAN.

AN amusing story has recently appeared in the papers concerning the new Soudanese military bands. Our excellent allies were much impressed with the British brass bands and proceeded to start one of their own. They managed fairly well and played British tunes without understanding much what they meant. One day a Soudanese died and the regiment and band attended the funeral. The band was on its mettle and when the body came in view began to play, but alas for the fitness of things, the tune selected was "Up I came with my little lot."

THE MEDICAL DIRECTORY.

To the Editors of THE LANCET.

SIRS,—Kindly allow me to draw attention to the great inconvenience caused by the present sectional arrangement of Churchill's Medical Directory, lately increased by cutting out Wales. If I want to find the whereabouts of a medical man I have to turn to *seven* different sections before I can find him. It would be far more convenient to have all names alphabetically arranged together, the initials (nearly always known) being a guide to the name. It is much less trouble to run through an alphabetical list of names than to have to turn about to so many different sections. The more a directory is sectionally divided up the more bulky and less useful it becomes. The universities and medical schools would be much more convenient placed all together than separated.—I am, Sirs, yours faithfully,

SUBSCRIBER OF TWENTY-FIVE YEARS' STANDING.

August 26th, 1898.

*** Wales is not "cut out" but only transferred to a section of its own. We must say, however, that we thought the old arrangement the more convenient.—ED. L.

Verax.—The local authorities first decide upon the appointment of a person or persons "possessing"—we are quoting a clause in the Food and Drugs Acts—"competent knowledge, skill, and experience as analysts of all articles of food and drugs." The appointment is then subject to the approval of the Local Government Board. There is no officially recognised qualification for the post, but we believe the Fellowship of the Institute of Chemistry counts for a great deal and may perhaps at a future time be accepted. Our correspondent might present himself for this diploma (F.I.C.), particulars of which will be furnished him on application to the secretary, Institute of Chemistry, 30, Bloomsbury-square, W.C. Years of laboratory practice would be the only way of "getting the work up" and the only course which would justify the candidate regarding himself as "possessing competent knowledge, skill, and experience."

Subscriber, &c.—The most natural and correct style is simply "Dr. X. Y. Z." Of the other two mentioned by our correspondent "Mr. X. Y. Z., M.D.," is sometimes used, and we see no reason why he should not employ the style "X. Y. Z., M.D.," except that it is not customary, but "Dr. X. Y. Z., M.D.," is quite unnecessary.

Mr. Edward Knight.—We do not fancy that there is any book dealing with popular medicine in the various countries mentioned by our correspondent. But there are various papers and articles scattered throughout journals and magazines. Our correspondent might get the information he desires by applying to the Folk Lore Society.

J. P. Dunelm.—Our correspondent is entitled to announce his change of residence and the circumstances under which it is made. The announcement should be made privately through the post.

X. Y. Z.—The drug recommended for mosquito "bites" was ipecacuanha, either the vinum or the powdered root made into a paste with water or vinegar being applied.

Mr. W. R. James.—We never prescribe. Our correspondent should consult his own medical man.

Mr. R. W. Garrett.—The name mentioned does not appear in the current Medical Register.

T. O. D.—We believe the institution in question is extinct. It is not to be found in the Post Office Directory.

F.—The average number of normal respirations in a healthy adult is from 16 to 20 per minute (Quain's Dictionary).

S. E. H. has omitted to enclose his name and address.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Sept. 15th, 1898.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radiation in Vacuo.	Maximum Temp. in Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks at 8.30 A.M.
Sept. 9	29·88	W.	...	121	91	68	68	73	Fine
,, 10	30·04	WNW	...	114	79	62	59	64	Fine
,, 11	30·05	N.W.	0·02	116	80	58	60	68	Raining
,, 12	29·93	N.W.	...	112	79	59	59	60	Fine
,, 13	30·12	W.	...	102	70	53	51	54	Fine
,, 14	30·20	SSW	...	113	81	54	59	62	Overcast
,, 15	30·35	S.W.	...	103	77	59	58	60	Foggy

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (19th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M., Ophthalmic 1.15 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), St. Mark's (9.30 A.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Royal Orthopædic (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), Westminster (2 P.M.), London Throat Hospital (2 P.M.).

TUESDAY (20th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), Guy's (1.30 P.M.), St. Thomas's (3.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat Hospital (2 P.M. and 6 P.M.).

WEDNESDAY (21st).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (2.30 P.M.), Gt. Ormond-street (9.30 A.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat Hospital (2 P.M.).

THURSDAY (22nd).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex, (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat Hospital (2 P.M.).

FRIDAY (23rd).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M., Ophthalmic 10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat Hospital (2 P.M. and 6 P.M.).

SATURDAY (24th).—Royal Free (9 A.M. and 2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), University College (9.15 A.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), St. Mary's (10 P.M.), Cancer (2 P.M.), London Throat Hospital (2 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

During the week marked copies of the following newspapers have been received: *Surrey Advertiser, Local Government Chronicle, Public Health, City Press, Local Government Journal, Pioneer Mail, Times of India, Liverpool Daily Post, Birmingham Gazette, South Wales Daily News, Scotsman, Citizen, Hertfordshire Mercury, Yorkshire Post, Sanitary Record, Buckingham Express, Eastern Morning News, Coventry Times, Perth Constitutional, Dundee Advertiser, Sheffield Telegraph, Torquay Directory, Cornish Telegraph, Burton Chronicle, Bristol Mercury, Manchester Courier, Leeds Mercury, Cambrian News, Worcestershire Echo, Beverley Record, Isle of Wight Times, Newark Advertiser, Dorset Chronicle, Devizes Gazettee, Glasgow Evening News, Ballinrobe Chronicle, West Britain Advertiser, Malvern Advertiser, Northern Telegraph, Shields Daily Gazette, Westminster Independent, Prescott Reporter, Selby Express, Woburn and District Reporter, Llanelly and County Guardian, Morecambe Times, &c., &c.*

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